NOVEMBER 20, 1961

PAPER TRADE JOURNAL

It Makes a Difference Which Size Press Roll is Driven, Says Expert

More on Project Finishing: If Not 100 Per Cent Hand Sorting, What?

How Titanium Dioxide Can Be Used As Filler and In Board Coatings

Felt Problems on Kraft Board Machines Tackled at Round Table

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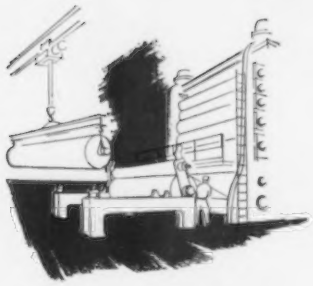
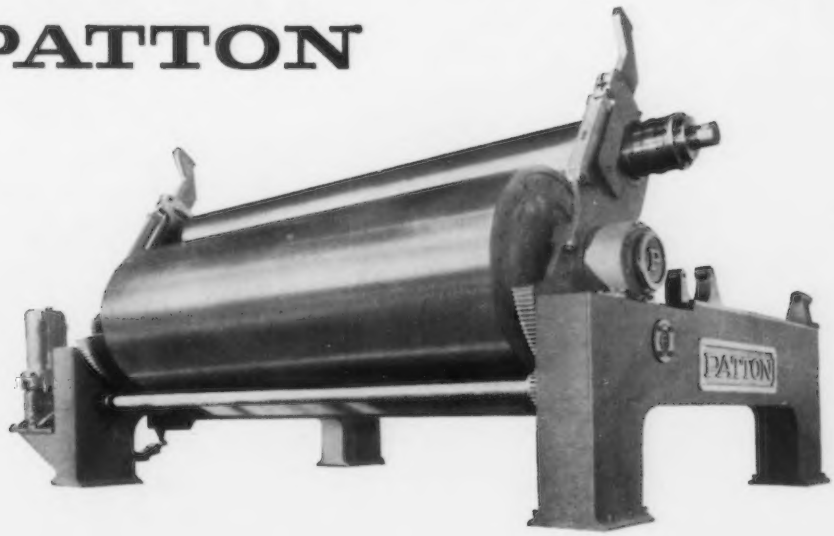


HORIZONTAL TRACK REELS

by PATTON



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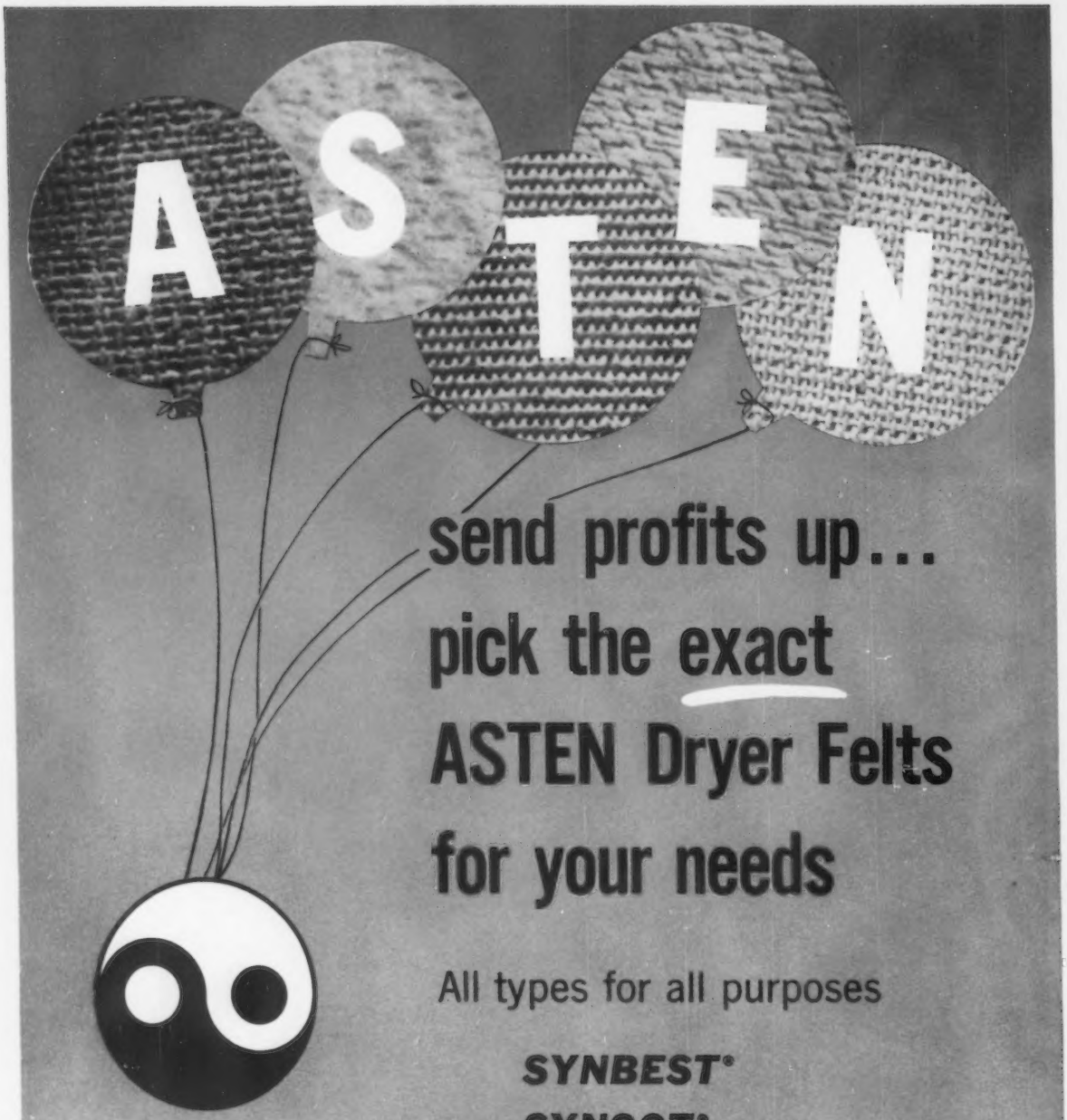

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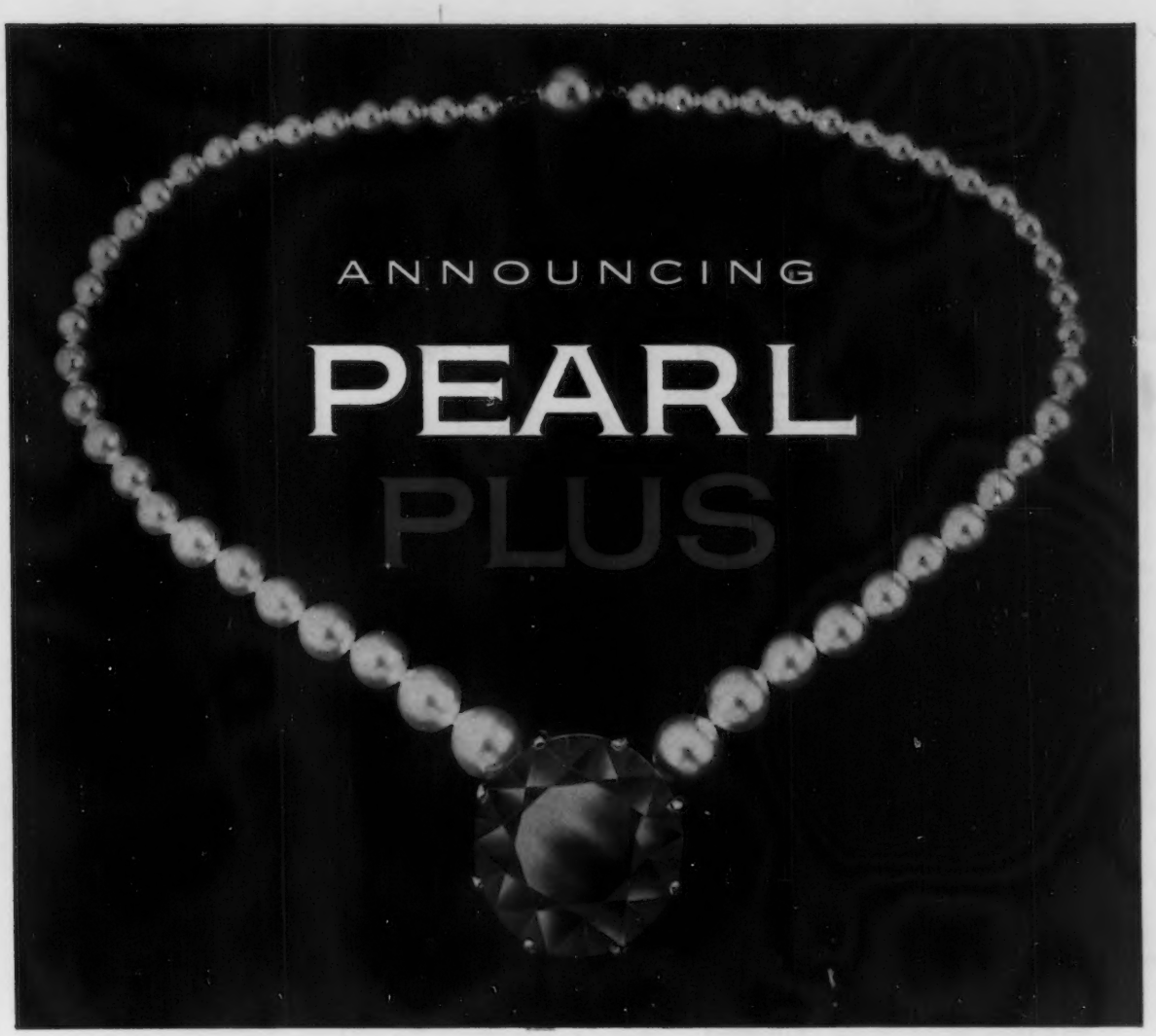

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Week of November 20, 1961
Vol. 145, No. 47

FEATURED THIS WEEK

Which Size Press Roll Should Be Driven?

And where should the rubber covered roll be located? To answer these, it is worth while to examine the behavior of size press rolls under various drive arrangements—Egon N. Kornicer **32**

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Acceptance Sampling in Fine Paper Finishing Operations

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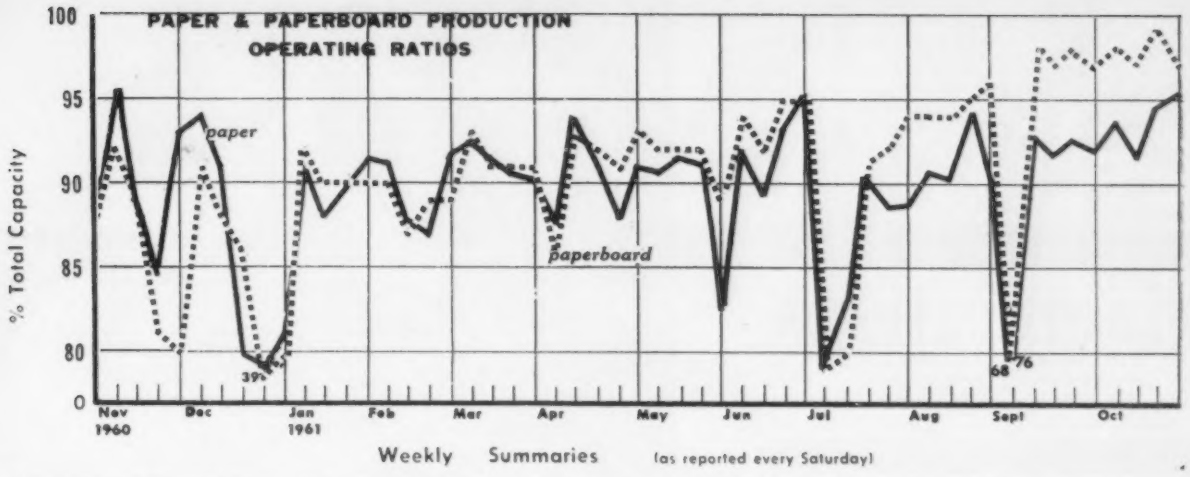

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REMEMBER THESE DATES

CPPA Technical Section, Annual Meeting, Queen Elizabeth Hotel, Montreal, Canada

JANUARY 22-26

Paper Week, New York City

FEBRUARY 19-22

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compression
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machine
salesman

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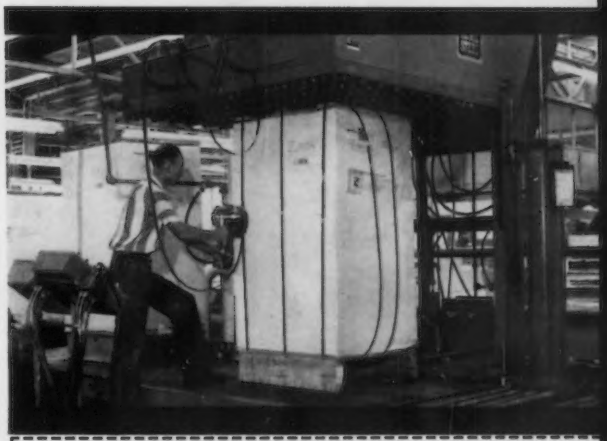

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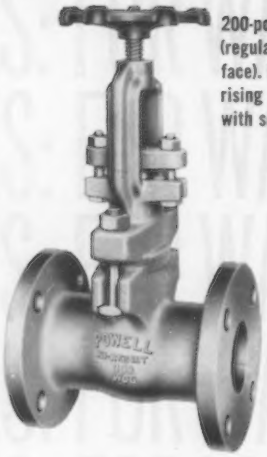
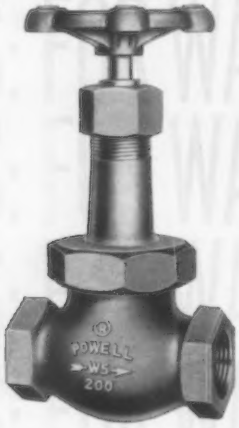
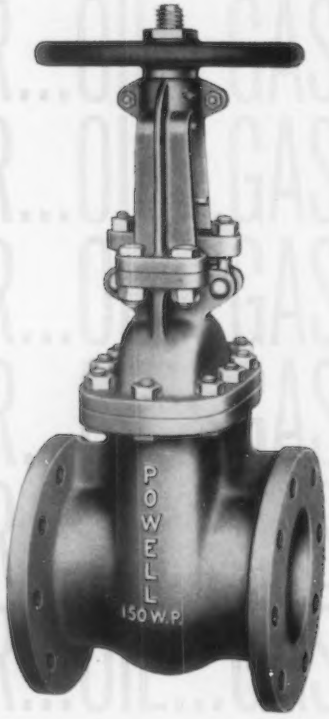
200-pound WOG 3% Nickel Iron Gate Valve for paper mill service—Fig. 1893. Bolted flanged yoke-bonnet, stainless steel (316) outside screw rising stem and seat rings, Ni-resist solid wedge. Sizes, 2" through 30".



200-pound WOG Ni-resist Gate Valve—Figs. 2195 (regular face to face) and 2196 (short face to face). Bolted flanged yoke-bonnet, outside screw rising stem. Sizes, ¾" through 3". Available with screwed ends, 225 WOG, ¼" through 2".

200-pound psi Bronze "W. S." Full Flow Globe Valve — Fig. 2608. Union Bonnet. Renewable, hardened, wear-resisting stainless steel plug type disc and seat. Sizes ⅛" through 3". Angle, flanged end and visual control valves also available.





150-pound W. P. Stainless Steel Gate Valve—Figs. 2453DG (double wedge, sizes 2½" through 8") and 2453SG (solid wedge, sizes 2½" through 18"). Bolted flanged yoke-bonnet, outside screw rising stem. Sizes, 2½" through 4" have one-piece yoke; 5" to 18", two-piece yoke.

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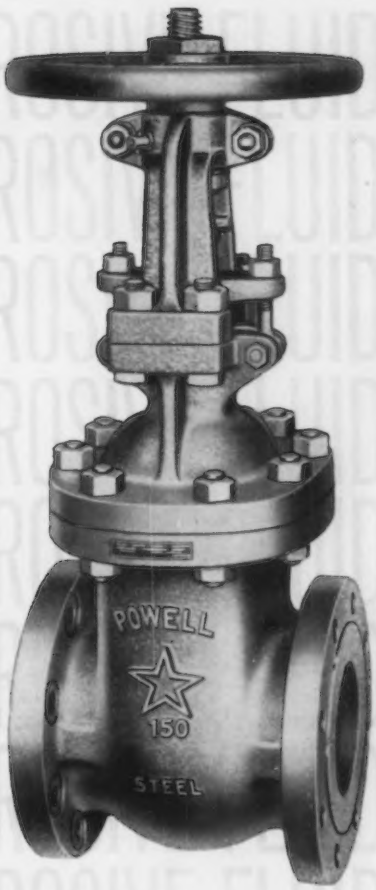
* Registered trade name of the International Nickel Company † Registered trade name of Haynes Stellite Company

200-pound WOG Ni-resist Swing Check Valve—Fig. 2192. Sizes 2" through 12". Small size valves have stainless steel seat rings, discs and disc hinges; larger sizes have Ni-resist discs with stainless steel (316) facing.

150-pound W. P. Flush Bottom Tank valve—Fig. 2309 (disc opens into tank) and Fig. 2310 (disc opens into valve). For convenient and fast draining of vessel. Available in stainless steel and other alloys, in sizes ½" through 8".



150-pound W. P. Steel Gate Valve—Fig. 1503 Bolted flanged yoke-bonnet, outside screw rising stem. Can also be supplied with screwed or welding ends. Sizes, ¼" through 30". Powell Steel Valves are available for pressure from 150 through 2500 pounds.

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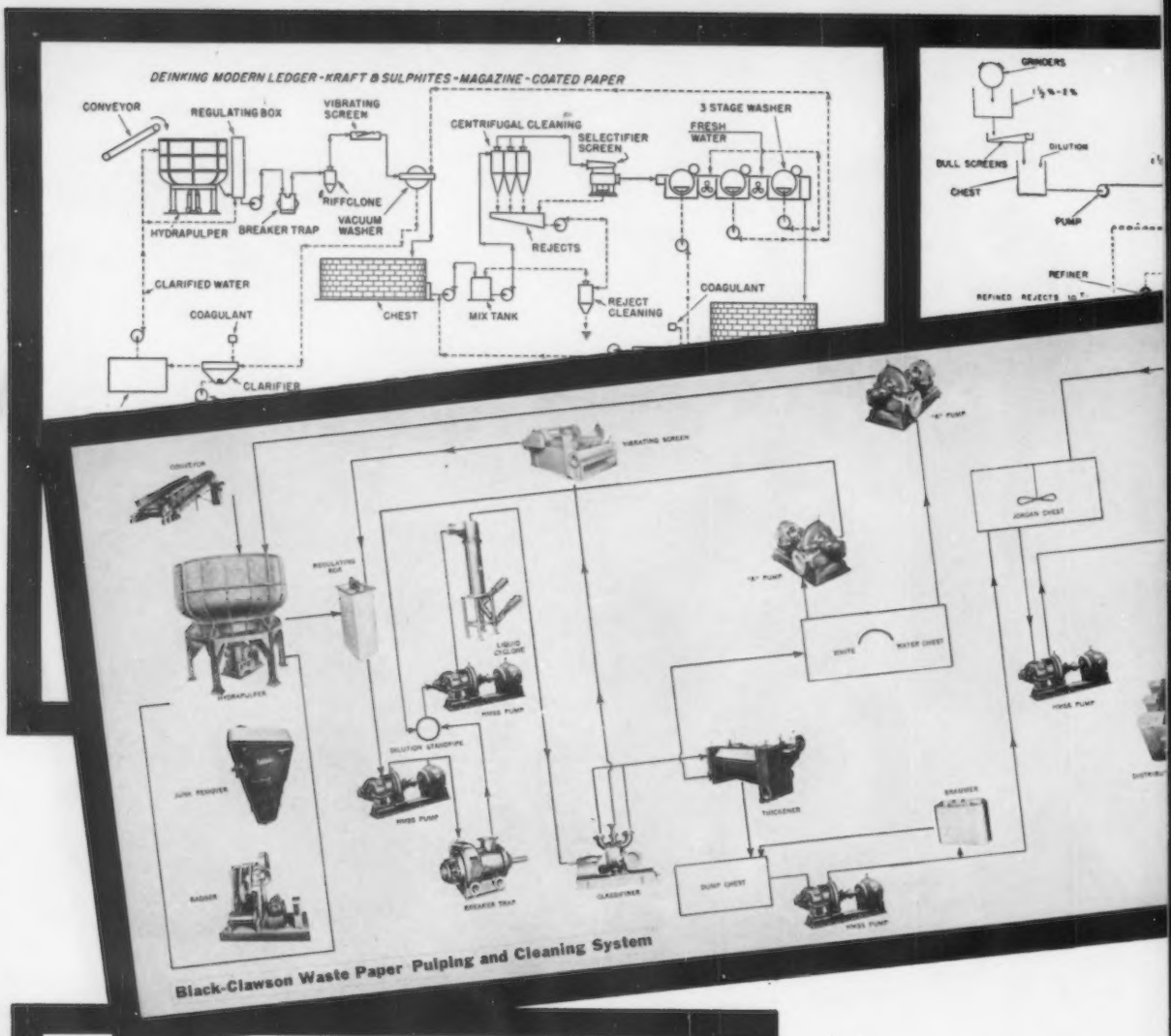

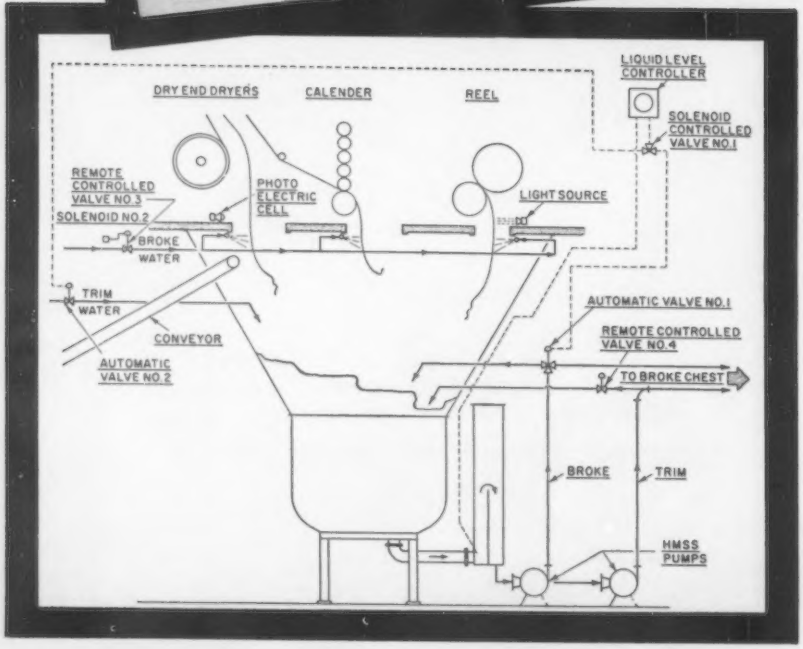

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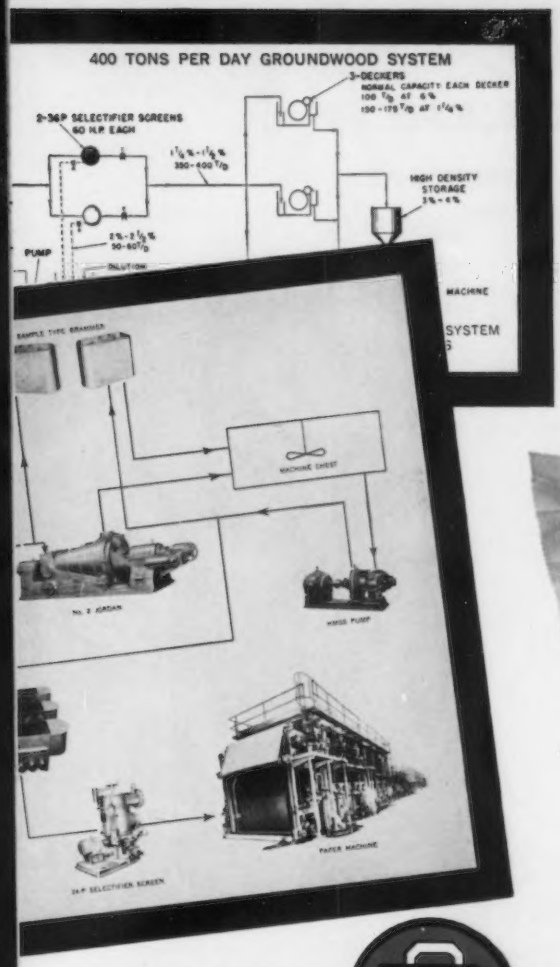

R. F. Vokes, V.P., General Manager, Shartle Division, standing, discusses plans for an integrated stock preparation system for a new paperboard mill with, left to right, D. G. Sutherland, Manager, New Products Sales Development; H. P. Espenmiller, Director of Laboratories; J. E. Hartford, V.P., General Manager, Paper Machine Division and E. M. Root, Shartle General Sales Manager.

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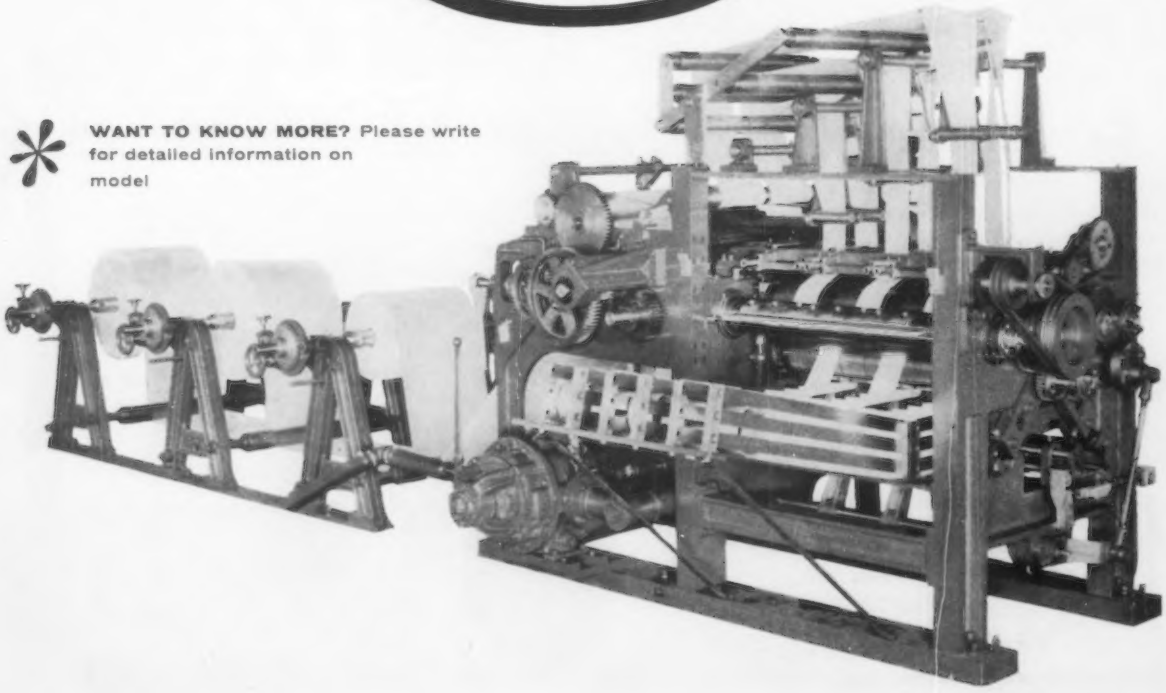
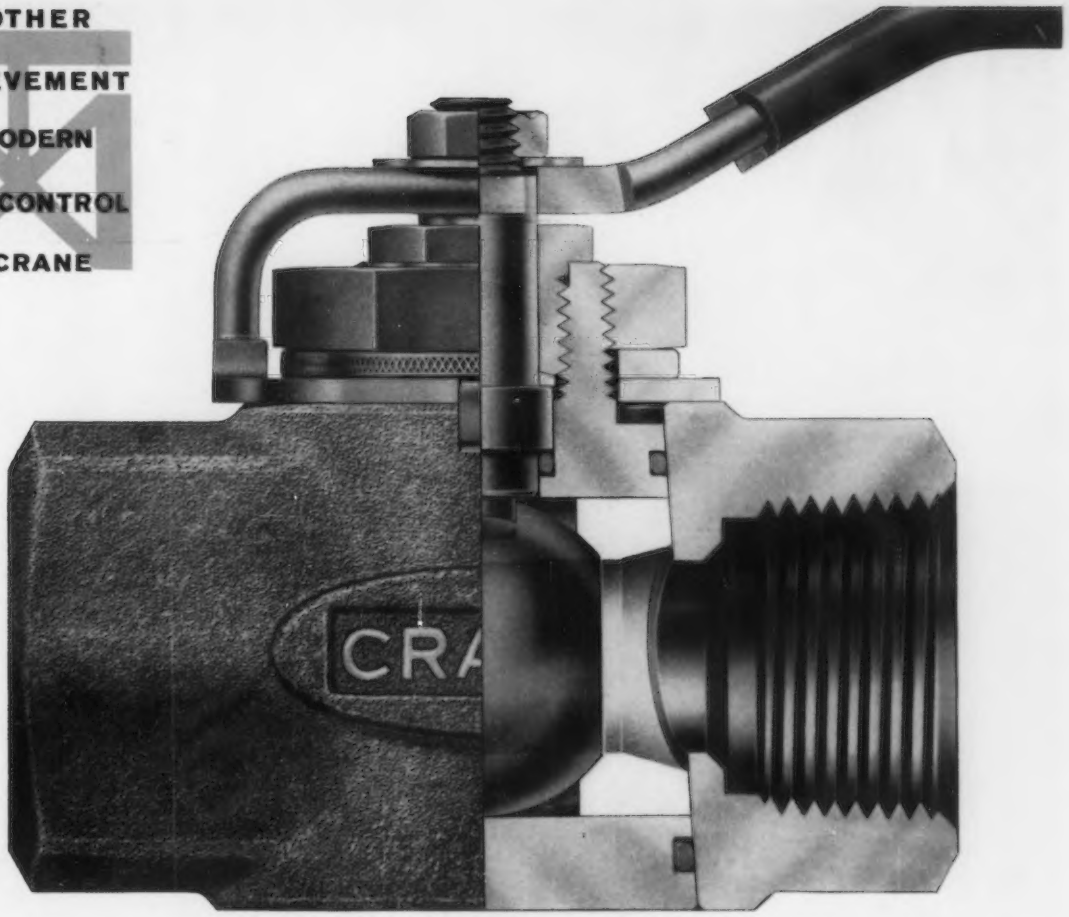


ANOTHER ACHIEVEMENT IN MODERN FLOW CONTROL BY CRANE



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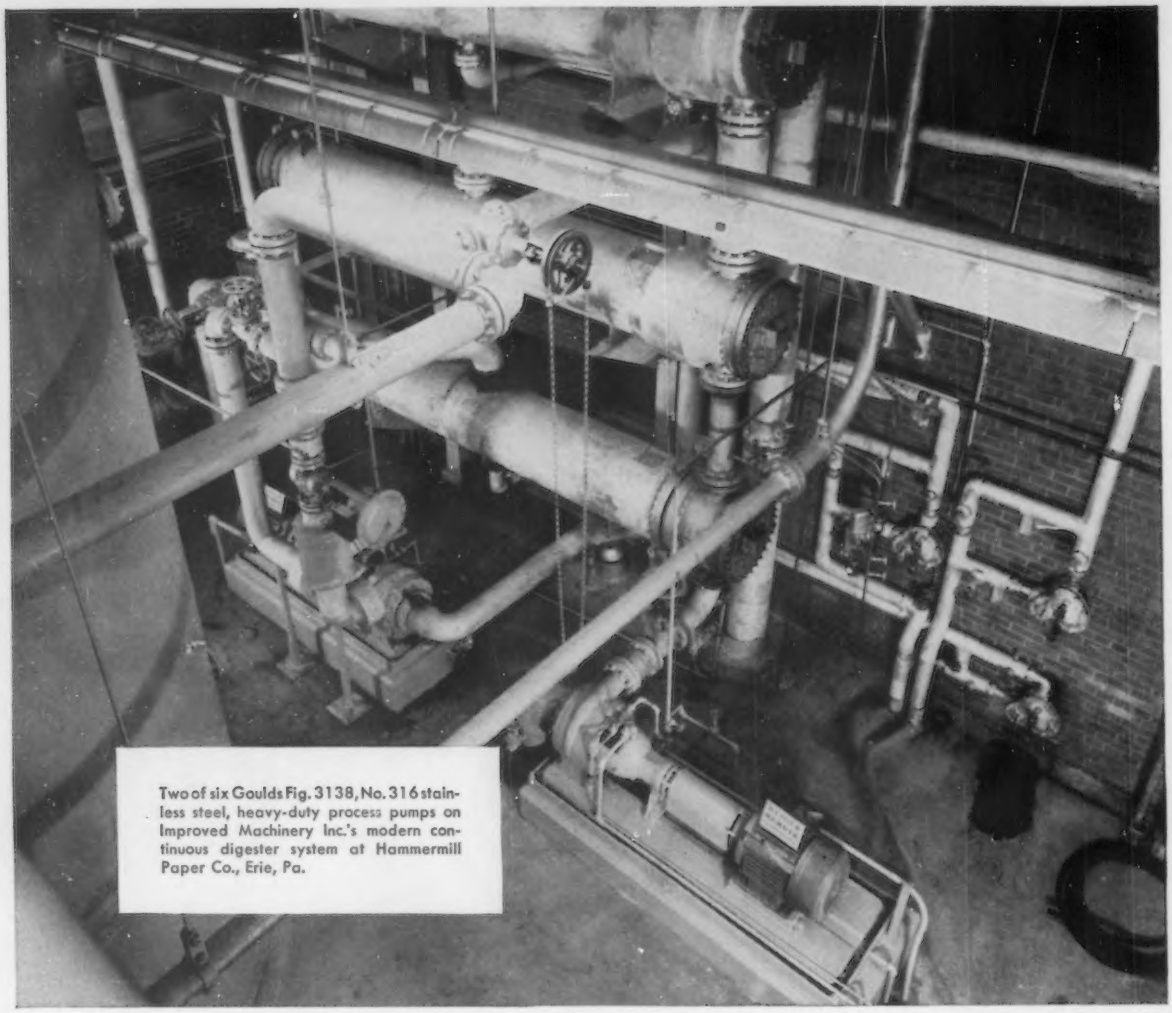

Two of six Goulds Fig. 3138, No. 316 stainless steel, heavy-duty process pumps on Improved Machinery Inc.'s modern continuous digester system at Hammermill Paper Co., Erie, Pa.

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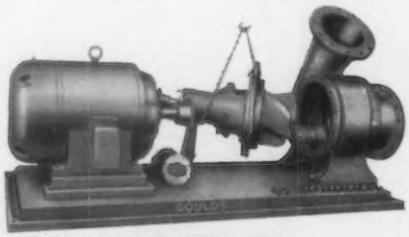

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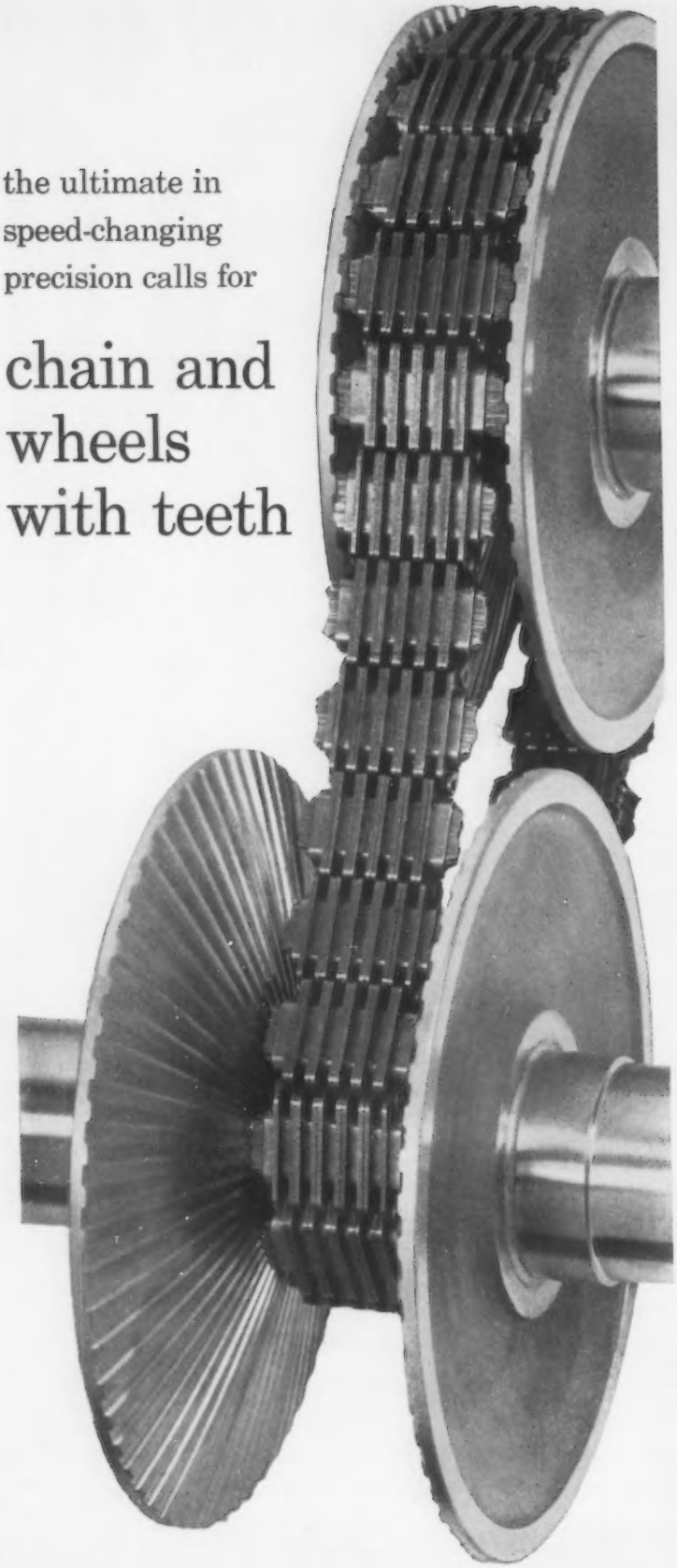

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The new Tennessee River Mill, near Counce, Tenn. Note outdoor-type C-E boilers (upper center). The mill was engineered and constructed by The M. W. Kellogg Company. H. A. Simons (International) Ltd., consultants.

C-E provides all steam for new, record-breaking

TENNESSEE RIVER MILL

Record-breaking in many ways, Tennessee River Pulp and Paper Co.'s new 500 ton/day kraft linerboard mill has one of the most ideal locations in the U.S.—near abundant supplies of water, pine and hardwood, and a natural gas pipe line. The mill's recovery and bark-power boilers are the first in the industry to employ full outdoor construction. • In keeping with their high engineering standards, the mill owners (a group formed of Packaging Corporation of America representing three merged companies, Bell Fibre Products Corp. and St. Regis Paper Co.) turned to Combustion Engineering for advanced-design steam generating equipment. This consists of a chemical recovery unit designed to burn 1,250,000 lb of dry solids a day, and a 300,000 lb/hr steam generator burning bark, gas and oil (with provision for future pulverized coal firing). Units operate at 600 psi and 750F. • C-E has long been a leading supplier of boilers for the paper industry—was the first to break the recovery unit "capacity barrier" and exceed 500 tons in capacity (an 800 ton C-E unit is now on order). For information on boiler designs for any pressure, temperature or capacity—for any fuel or combination of fuels...call your local C-E office or write the Paper Mill Division in Windsor. • ***Ask for the new catalog: "C-E Equipment for the Pulp and Paper Industry."***

Night view of C-E boilers—recovery unit at the left, bark burner at the right.

COMBUSTION ENGINEERING C-E

C-339

General Offices: Windsor, Conn.
New York Offices: 200 Madison Avenue, New York 16, N. Y.
Canada: Combustion Engineering-Superheater Ltd.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

DESIGN

TALK MACHINE
CHARACTERISTICS
WITH YOUR
ALBANY FELT
SALES ENGINEER

Felts that perform ideally result from built-in qualities essential to each papermaking machine and each papermaker's objectives. That's why each Albany felt is custom designed to assure performance on the specific machine and specific position for which it was manufactured. That's why Albany Felt Sales and Service Engineers seek every possible bit of knowledge about your machines — their characteristics, felt performance reports, and each of the factors which guide the design of your future felts.

Each design is aimed at building-in those features which provide the right water removal, the exact finish qualities, and the longest possible felt life.

Proper design of Albany felts is a principal contributor to the superior felt performance you have every right to expect.

AF

ALBANY FELT COMPANY

ALBANY, N. Y.

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C. Cowansville, Quebec Cuautitlan, Mexico

Disston has the edge

Mr. J. B. Mahan, Saw Filer, Sproul Lumber Company, Uniontown, Pa., says:

"Disston bands hold tension and their cutting edge better than any other I have ever used."

Mr. Mahan, who has been a saw filer "all my life," says, "we are running a double shift, so our Disston bands get plenty of hard wear. Even after running four hours the edge is still good—even cutting hard wood."

Disston's rugged, long running, high nickel content alloy steel bands can take it! They are manufactured with the most modern equipment and techniques. For example: the welds are made by the latest Heliarc method to give the toughest joint possible; breaking at the weld is eliminated. That's why Disston can guarantee the welded joint to be as strong as any part of the band. Such skill in every phase of production makes Disston bands tough enough to resist the strain of fast-feed cuts and constant flexing over wheels at high speeds while maintaining excellent edge holding qualities.

Not satisfied with the performance of your present bands? Next time specify Disston band saws—they really have the edge!

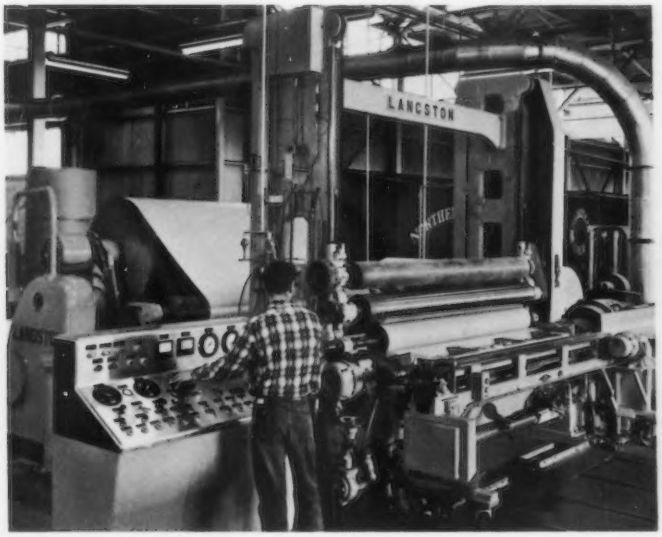
For further information, write to Disston, H. K. Porter Building, Pittsburgh, Pa.

PORTER *DISSTON DIVISION*
H. K. PORTER COMPANY, INC.

Langston Leader

LEADERSHIP BY DESIGN

NOV. 1961 | Published for information of paper and board mills by Samuel M. Langston Company, Camden 4, N.J. | VOL. 3, NO. 6



REWINDING COUNTER ROLLS, an overall view of the installation.

AS SALVAGE ROLL REWINDER, with lowering table partially up.

Counter Roll Winder Scores

ROLL QUALITY GAINS PRAISE AND BUSINESS

Machine Also Incorporates Salvage Winder Capability At St. Regis Tacoma Plant

Serving the functions of two winders, a single Langston slitter and winder is doing noteworthy double duty for St. Regis Paper Company at its Tacoma, Washington, plant.

Designed primarily for the plant's new counter roll business, the new Langston machine is also built to handle requirements of a salvage rewinder.

As a counter roll winder, its automatic features have resulted in volume production of top quality counter rolls with minimum manpower.

The other or auxiliary function of this "dual purpose" machine is to salvage cull rolls from machine winders and other finishing operations in the mill. From the very light to the very heavy grades, the winder also produces shipping rolls of uniformly high quality up to 60 inches in diameter.

The machine's performance on counter rolls alone has evoked numerous compliments from customers on roll quality and has helped get new business as well as expressions of preference from government procurement officials.

• • •

The double duty winder is a Langston 96-inch trim, type CA, with 60-inch diameter rewind capacity. A Langston shaftless unwind stand is used for rolls up to 96 inches wide, 60 inches in diameter, and weighing as much as 6500 lbs.

• • •

A strong contributor to the efficiency of the machine is its Langston shaftless unwind stand, with constant tension control and special decelerating components, plus pneumatic side register control—the latter an important feature in minimizing trim waste.

Installed in the counter roll production line, the winder is equipped with a wheel-mounted, roll stripping mechanism manufactured by Lamb-Grays Harbor Manufacturing Company so that rolls can be speeded to the adjacent wrapping table. When salvage operations are desired, this portable stripper easily rolls out of the way so that the permanently installed Revolvator lowering table can be utilized.

• • •

To minimize manpower needs and expedite roll production, the machine provides numerous automatic controls on the console and at convenient operating stations and other features to

(continued on next page)

Counter Roll Quality Wins Praise, Business

(*continued from preceding page*)

facilitate output.

Such controls and features include:

- Roll ejectors, one for counter rolls and another for salvage rolls.
- Sheet holder to keep the sheet taut against the front drum during roll changes.
- Automatic air jets to blow the tail of the cutoff sheet over the rewind shaft for quick restarts.
- Side frame limit switch, controlling the diameter of rewound counter rolls and automatically decelerating and stopping the winder at preselected diameters.
- Specially designed Reliance drive providing for the continuing acceleration and deceleration characteristic of counter roll operations.
- Air brakes on winding drums and idlers.
- Hydraulically controlled rider roll so that operator can control roll pressure as desired.
- Rewind shaft bearing brackets of special inverted U-shaped construction and hydraulically powered.

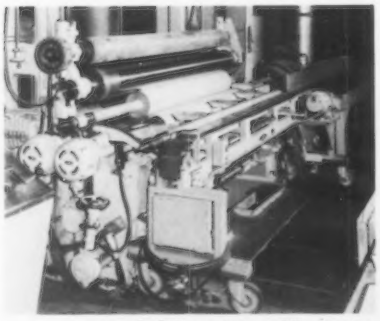
• • •

Salvage roll features in addition provide:

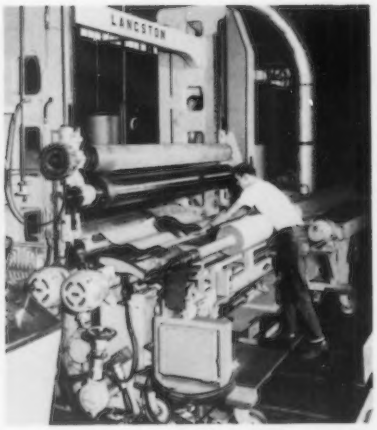
- Conventional latch-type rewind shaft brackets to replace the inverted U-type of the counter roll operation.
- Roll ejector for large diameter rolls as mentioned above.
- Drive capacity to wind large diameter rolls of heavier grades at reduced speed.

• • •

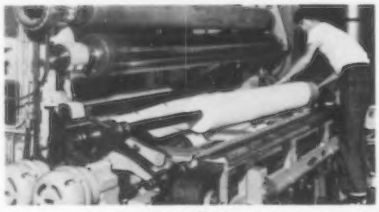
Fitted with Langston's quick-setup, shear-cut slitters, guaranteed to run true within .001 of an inch, the machine keeps manpower tasks to a minimum and is overall designed for high-rate production and low cost operation.



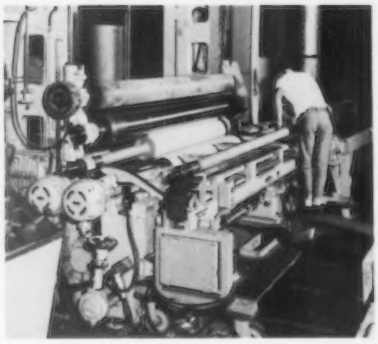
. . . next shaft in position while running



. . . rolls ready for stripping



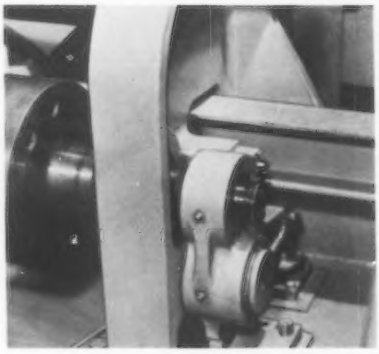
. . . counter roll ejector in operation



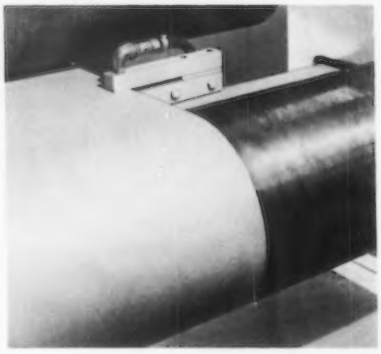
. . . coring up

. . . next shaft loaded as one awaits stripping

. . . an overall backstand view of the installation



. . . tension control



. . . side register control

Avoid needless reprocessing costs with Texaco's new "Stop Loss" program

INCREASE NET PROFITS BY AS MUCH AS 8.8%

Don't overlook the importance of organized lubrication as a factor in minimizing reprocessing losses. Texaco's new "Stop Loss" Program not only helps you produce more saleable paper, but also extends bearing life . . . cuts downtime . . . even reduces lubricant inventories and purchasing costs.

This unique Program can cut your over-all maintenance costs by as much as 10%. *These savings can increase net profits by as much as 8.8% per year.**

How a "Stop Loss" Program works—Basically, a "Stop Loss" Program is concerned with modernizing and controlling lubrication practices—from purchasing right through actual application.

Texaco lubrication engineers help specify the right lubricant and lubrication interval for every piece of equipment—from woodyard to machine shop. Particular attention is given to such paper mill problems as wet and dry end lubrication and water contamination. Lubrication responsibility is delegated . . . a workable system of lubrication control is set up.

For full details on how a "Stop Loss" Program can fit into your operation and earn dividends for you, write: Texaco Inc., 135 E. 42nd St., N.Y. 17, N.Y., Dept. PT-61.

***The U. S. Department of Commerce estimates that a paper mill doing a $10,000,000 yearly business will spend about $650,000 for maintenance. A 10% reduction in maintenance costs would amount to $65,000. Assume that profits average 7.34%—or $734,000. By adding the 10% maintenance saving, profits now total $799,000 . . . an 8.8% increase.**

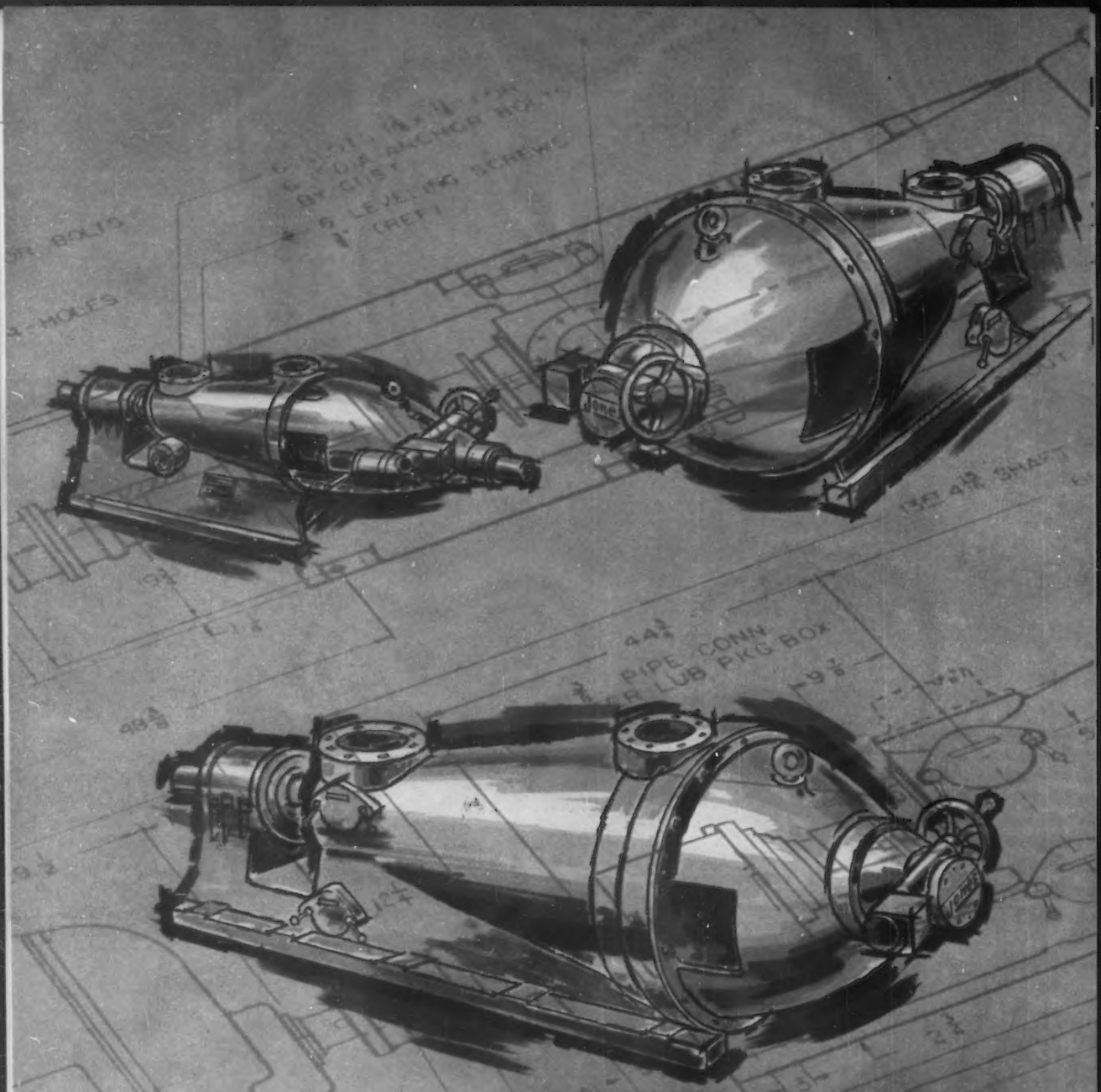
Tune In: Texaco Huntley-Brinkley Report, Mon. Through Fri.-NBC-TV.

TEXACO

Throughout the United States

Canada • Latin America • West Africa

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL



Leadership through constant improvement

What is it that makes Jones the leader in stock preparation equipment? We believe the answer lies in a pair of deceptively simple questions: "What's the paper industry doing? . . . How can we help them to do it better?"

Guided by a continual and exhaustive study of the industry's changing needs, our people are devoting their time and talent to the challenge of making good equipment better. Take Jones conicals, for example. Sometimes it's a small improvement . . . a switch here, a new lube line there. Another time it's a major change . . . a new overall design . . . a better method to give longer, more accurate "on the line" service.

In a very real sense, we must share the credit for our leadership with the people of the pulp and paper industry. It's at their request . . . and with their technical co-operation . . . that we're able to produce a continuing better product for better papermaking.

E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

CANADIAN ASSOCIATES: THE ALEXANDER FLECK LTD., 75 SPENCER STREET, OTTAWA

Trends

Paperboard Output Setting New Records

Paperboard production this fall continues to set new records almost every week. The week ending November 4 set a new high of 388,000 tons. With orders and production at record peaks, excess capacity can no longer be used as an explanation for poor earnings.

U. S. Pulp and Paper Machinery Exports Up

U. S. paper machinery exports in the first half of 1961 were valued at $14.9 million dollars compared with $12 million in the first half of 1960.

Japan Predicts Fabulous Increases

Japan which recently displaced Great Britain as the world's third largest paper producer is predicting fabulous increases in demand for the next nine years. The Japan Pulp Federation predicts demand for all kinds of paper in 1970 will increase by 160% over 1960 consumption. This is broken down as follows: paperboard 3.3 times, foreign style paper 2.3 times and Japanese style paper 1.95 times.

Folding Box Gain Marginal in Sept.

Shipments of folding carton gains were small in October, it was announced by the Folding Paper Box Ass'n. Dollar volume of shipments were only 0.2% more than October 1960 and tonnage was up 0.3% for the same period. Volume for ten months this year is 0.9% below 1960, while tonnage of shipments trails last year by 1%.

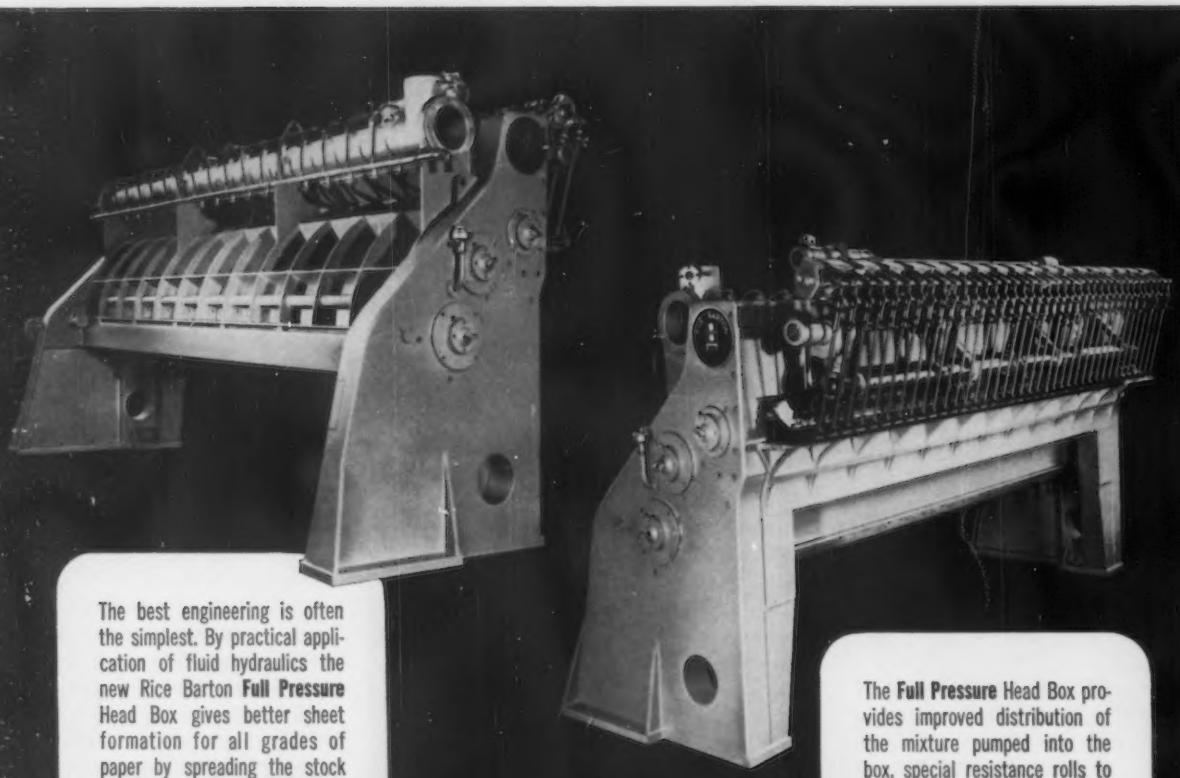
Capital Appropriations up 20% in Third Quarter

U. S. industry's appropriations for capital expansion jumped 20% between the second and third quarters of 1961, according to Newsweek's latest Quarterly Survey of capital appropriations. The survey, which was conducted by the National Industrial Conference Board among 1,000 leading U. S. manufacturers, reports that this is the first time since the third quarter of 1959 that both durable and nondurable goods industries have boosted their expansion plans.

U. S. Pulp Output up 4% in September

U. S. pulp production in September ran 4% above that in the same month a year ago. Production for the nine months was 2% above that period in 1960. Domestics shipments were off 4% for September and 6% for the period, while exports were off 4% for the month but still up 4% for the period. Exports to Europe continued to slip from the records set earlier this year, with figures of −8% for September and −1% for the first three quarters.

Better Sheet Formation for all grades of paper with Rice Barton's **Full Pressure** Head Box



The best engineering is often the simplest. By practical application of fluid hydraulics the new Rice Barton **Full Pressure** Head Box gives better sheet formation for all grades of paper by spreading the stock evenly from the header through the box onto the wire.

The **Full Pressure** Head Box provides improved distribution of the mixture pumped into the box, special resistance rolls to even the flow inside the box and a nozzle adjustment that floats the stock onto the wire the full width of the machine—smoothly, thoroughly mixed, without streaks or boiling. Write for more details.

Rice Barton CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS

PAPER TRADE JOURNAL

WEEK OF NOVEMBER 20, 1961

Thilmany Signs Contract for New M. G. Paper Machine

A new paper machine designed to increase paper production capacity by 20 to 25 per cent has been ordered by the Thilmany Pulp & Paper Co., Kaukauna, Wis. The new unit is scheduled to go into operation in the second quarter of 1963, according to the board of directors of the firm.

Decision to buy another paper machine follows the recent start-up of the firm's expanded power facilities, which include a new 390-ton Babcock & Wilcox recovery boiler and a G. E. 15,625 kw. steam turbine generator.

Thilmany currently has seven paper machines in operation. The first five were dismantled prior to 1953 when they became obsolete.

No. 13 paper machine, to be built by Beloit Iron Works, will have a wire width of 180 inches and will be capable of producing M.G. papers in weights from 6 pounds to 60 pounds. It will be a vacuum pick-up machine, principally producing carbonizing papers.

Construction of a new machine building is scheduled to get under way early next year.

Ecusta to Add New Machine For Lightweight Papers

Plans for a new paper machine and auxiliary facilities for the production of lightweight papers have been announced by A. J. Loeb, division vice president of Ecusta paper operations, at Pisgah Forest, N. C. Ecusta is part of the Packaging Div. of Olin Mathieson Chemical Corp.

The new fourdrinier paper machine, No. 11, will be similar to Ecusta's No. 10 machine, the "Cherokee Arrow," which, when it was put into operation in 1958, was one of the largest machines in the world designed for the manufacture of lightweight papers.

The new machine will be housed in a building approximately 50 feet wide by 500 feet long, containing two floors and several mezzanines immediately adjacent to the No. 10 machine building. It will produce paper approximately 160 inches wide and will operate at speeds ranging from 700 to 1,000 feet per minute. According to Mr. Loeb, it will greatly improve Ecusta's ability to meet increased customer requirements for cigarette, lightweight printing, and one-time carbon papers.

Engineering and design work has already commenced. Construction is scheduled to start in early spring of 1962, and should be completed during the second half of 1963.

Ecusta now has ten paper machines in operation. In addition to lightweight papers for the tobacco, printing, and carbon paper industries, Ecusta manufactures tipping and permanent wave tissues, cigarette filters, specialty wrapping papers, endless woven belts, and other high quality lightweight papers.

The Ecusta plant began operation in 1939 to supply American cigarette manufacturers with cigarette paper. The original mill had four fourdrinier paper machines, designed primarily for the manufacture of fine quality cigarette paper. Four more machines were added in 1941, a ninth machine was erected in 1947, and the tenth and largest machine was put into operation in 1958.

W. F. Taylor, Jr. assistant to the division vice president, will serve as project manager, and Chas. T. Main, Inc., of Boston will be the consulting engineers for the project.

Late News Flash

S. D. Warren Co. is planning to build a new paper mill at its Muskegon, Mich., plant next year, which will increase the company's annual tonnage by 30,000 tons, to about 220,000 tons, George Olmstead, Jr., president, told the New York Society of Security Analysis.

C-Z Boosts Kraft Pulp Capacity at Camas

Crown Zellerbach Corp. has announced a $1 million improvement program to increase the daily capacity of its Camas division kraft pulp mill by 50 tons.

A power boiler with a rated capacity of 350,000 pounds of steam per hour will be added to the present power plant facilities. In the kraft mill, two tubes will be added to the mill's Pandia continuous digester system and a new set of evaporators will be installed.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending November 4, 1961 at 95.4 per cent, compared with 94.7 per cent, revised, for the preceding week. The ratio was 91.8 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending November 4, 1961 at 97 per cent, compared with 99 per cent for the preceding week and 88 per cent for the corresponding week a year ago. Paperboard production for the week ending November 4, at 388,000 tons, was a new record high for one week.

(Detailed Statistics on page 62)

South African Pine Going To European Pulp Mills

A total of 7.5 million cubic feet of South African pine pulpwood is to be shipped to 19 European wood pulp mills, under contracts between a Johannesburg firm and European buyers.

The increasing demand for wood in the building construction sector has caused scarcities and heavy price increases for pulpwood in Europe.

First shipments of about 1 million cubic feet of pine pulpwood were scheduled to leave South African ports in October and November. The entire contract for 7.5 million cubic feet is expected to be completed within a year. The total South African pulpwood shipments will provide for about 50,000 tons of chemical wood pulp.

Canadian Firms Consolidate Sales Activities

The newsprint and pulp sales of Price Brothers & Co., Ltd., the Anglo-Newfoundland Development Co., Ltd., and Gaspesia Pulp and Paper Co. Ltd., are being consolidated.

This has been announced by T. Ross Moore, who was appointed president and chief executive officer of Price Brothers at a meeting of the company directors on September 22. Mr. Moore explained that the reorganization is being effected so that the single resultant unit will provide diversified and efficient service and supply to customers.

He said that Wickliffe B. Moore, president of Northeastern Paper Sales, Inc., of New York, will be in charge of sales of the merged group, and will continue in that capacity after the consolidation.

The Northeastern Paper Sales Co. has handled all the sales of newsprint and pulp products manufactured by the Anglo-Newfoundland Co., and Gaspesia Pulp and Paper Co.

The merger makes this group one of the world's largest newsprint producers, with markets in Europe, North America, South America, Central America, Australia, Africa, Ceylon, India and elsewhere.

The reorganization of the group's sales activities is a further step in the consolidating policy, following the merger of the three companies which took place earlier this year.

Dennison Purchasing Eastman Tag & Label

Dana C. Huntington, president of Dennison Manufacturing Co., has announced that the company has completed negotiations for the purchase of Eastman Tag & Label Co., a California corporation. Eastman for many years has occupied a prominent position in the West Coast tag and label industry. It presently employs some 300 persons and owns manufacturing facilities in the San Francisco and Los Angeles areas. The purchase involves payment in cash to Eastman stockholders which will be financed by Dennison out of earned surplus.

Mr. Huntington further stated that this acquisition, which is expected to add about $3,500,000 to the company's annual sales, provides needed production facilities on the West Coast. It also brings under the Dennison name certain paper products which are complementary to existing Dennison lines and permits a broader distribution of present products.

It is the directors' intention to operate this new wholly owned subsidiary for the present under the existing name of Eastman Tag & Label Co. Eventually the new subsidiary will distribute other Dennison products as well as continue the production and sale of existing Eastman merchandise.

P.C.A. Expands Mill Improvement Program

An expanded $3,250,000 major mill improvement program, involving three of the company's eight paperboard mills, has been announced by Packaging Corp. of America.

The mill improvement program at Filer City, Mich., now under way, has been expanded from a previously announced $1,000,000 to $2,700,000. It includes construction of an 81,500 square foot addition, installation of new finishing equipment, and major machine additions and revisions.

Mill improvements also are under way at two other PCA mills.

At Rittman, Ohio, addition of clay coating equipment costing $300,000 will enable that mill to produce superior white grades of paperboard and at the same time permit substantial production economies.

At Tama, Iowa, addition of clay coating equipment costing approximately $250,000 will enable the company to market superior white grades of paperboard economically for the first time in an important three-state market.

Correction on Wausau Magnefite Data

EDITOR, PAPER TRADE JOURNAL

In regard to the recent article on Magnefite pulping, it has been called to my attention that the data contains some errors. I refer especially to Table II of the Article "World's First Commercial Magnefite Installation" appearing in your October 9, 1961, issue. Three sets of figures in this table should be corrected to read as follows:

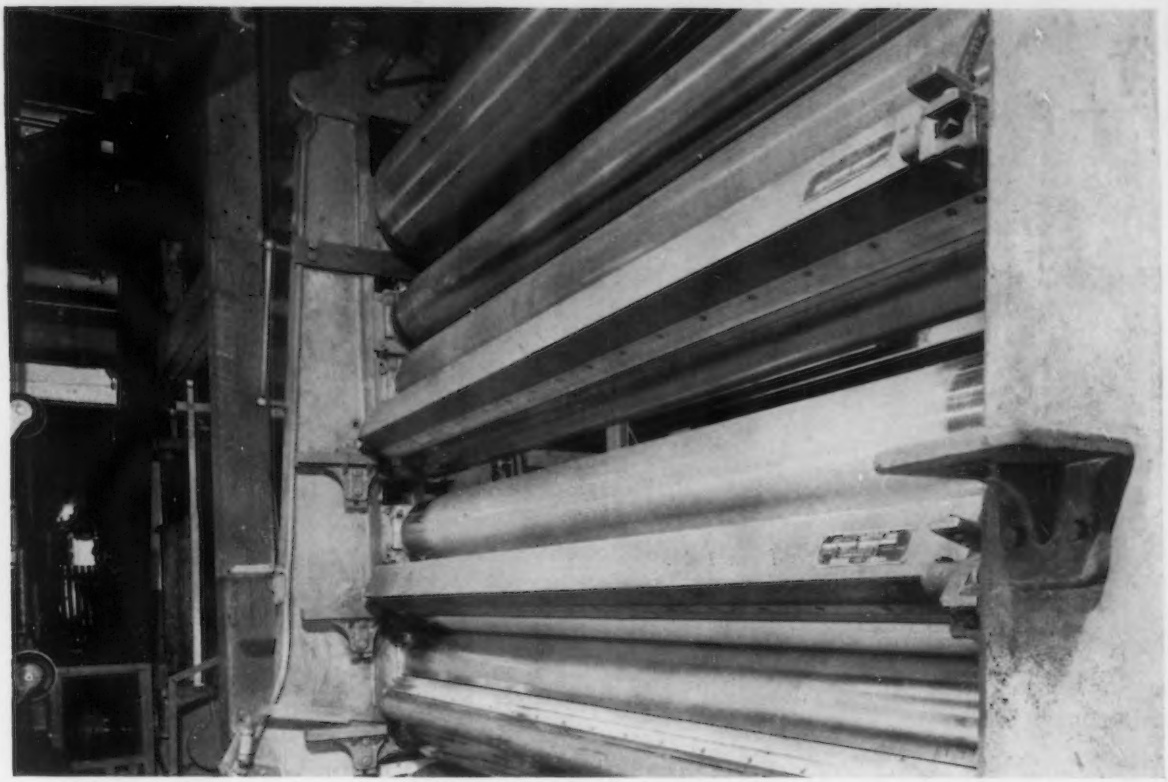
Table II (Errata)
Magnefite Cooking Conditions
as Compared to Ammonia Base Acid Sulphite Cooking

Wood Species	Spruce		Birch		Poplar	
Chemical Base	MgO	NH_3	MgO	NH_3	MgO	NH_3
Cords per Charge	18.7	18.4	18.9	20.8	22.7	21.1
Unbl. Yield, Cds. per A.D.T.	1.47	1.60	1.45	1.88	1.65	1.74
Tons per Blow	12.7	11.5	13.1	11.1	13.8	12.1

This error occurred through no fault of yours as incorrect data was furnished to you. It would be appreciated if this corrected data could be published, as I am sure it would save us both some time in explanations.

My apologies, sir.

Wausau Paper Mills Co.
Robert S. Howard
Technical Director



When you specify

VICKERY DOCTORS

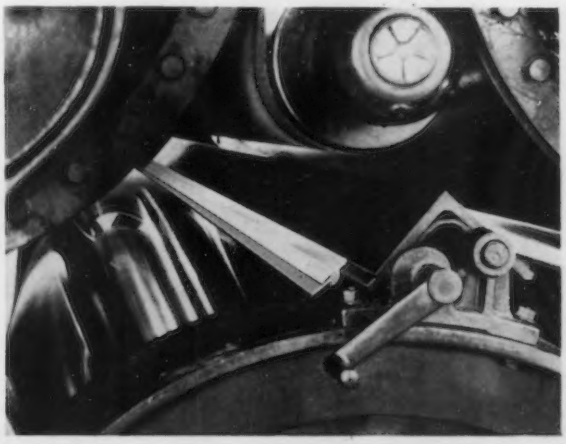
you're sure that each Doctor is specifically and correctly designed for the given roll dimensions, roll composition and roll application.

Vickery Doctors are installed by expert application engineers and are backed by unequalled doctor design and engineering experience.

When you specify

VICKERY DOCTOR BLADES

for replacement of worn blades you're sure that they are carefully selected and fitted to do the job for which the Doctor was designed and installed.



BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND 4, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

PAPER PEOPLE

J. E. Mailhos

Mailhos Promoted At Hudson Paper

Joseph E. Mailhos has been promoted to the newly created position of assistant manager, pulp and paper manufacturing, for Hudson Paper Co.'s Palatka mill.

Mr. Mailhos joined Hudson in 1960 as plant engineer at Palatka. Before joining Hudson, he had been associated with Bowaters Southern Corp. and Owens-Illinois Glass Co. in various maintenance capacities.

A graduate of Georgia Tech, Mr. Mailhos is a native of Elizabeth, Louisiana.

Crozier and Martin Step Up at Fraser Paper

G. L. Crozier has been appointed as assistant mill manager at Fraser Paper, Ltd., and will assume full responsibility for engineering, steam and power, yard, protection, janitor and watching services.

Prior to his appointment, Mr. Crozier had served as plant engineer of the mill and then later as special assistant to the mill manager.

R. J. Martin, who has been assistant mill manager since 1954, will continue in that capacity and in addition to regular management duties, will assume full responsibility for the bond, coating and finishing operations from order scheduling through roll wrapping, roll finishing, sheet processing, shipping despatch and customer relations.

Cons. WP&P Promotes Two at Appleton Division

Appleton Division of Consolidated Water Power & Paper Co. has announced two promotions.

Louis A. Kasten has been appointed woodroom foreman. He succeeds Joseph H. Quell who recently retired. Mr. Kasten joined the Appleton plant in 1926 and has served in various capacities in the woodroom since 1946.

Martin L. Rackow has been named plant mechanical engineer. A graduate of Milwaukee School of Engineering, he has been employed at Appleton Division since 1960 as a junior mechanical engineer.

Westvaco Assigns Peck To Brazil Production Post

West Virginia Pulp and Paper Co. has assigned E. G. Peck of Richmond, Va., to an important post on the production staff of Rigesa, S. A., the company's Brazilian subsidiary.

Mr. Peck, now production manager of the company's Hinde & Dauch Division plant in Richmond, will be groomed over the next few months to become production manager of Rigesa. The position encompasses responsibility for all production at the plant, which includes a pulp and paperboard mill and a large corrugated box factory.

Morris M. Waldrop, Hinde & Dauch regional engineer now headquartered in Richmond, has been named to succeed Mr. Peck as production manager of the Richmond plant.

In his Brazilian assignment, Mr. Peck is slated to succeed a former Covington, Va., man, James M. Loving, who completes his tour of duty in the early part of next year, at which time he will return to the States for reassignment. Mr. Loving has been with the Brazilian subsidiary since 1956.

Rigesa, S. A., a wholly owned subsidiary, was acquired by West Virginia Pulp and Paper Co. in June 1953.

The company operates a pulp and paperboard mill and a box factory at Valinhos, State of Sao Paulo. Since the property was acquired, a second paper machine has been installed and placed in operation and the pulp mill and box plant were modernized completely. Rigesa supplies corrugated shipping containers, gummed tape and other products to a growing portion of the Brazilian market.

William Fredericks

Fredericks Steps Up At KVP Sutherland

KVP Sutherland Paper Co., KVP Division, has appointed William Fredericks as general superintendent of the Wax Production Department. In his new capacity, Mr. Fredericks will report to Cobe Jager, superintendent of the Wax Division.

Mr. Fredericks joined KVP's Research Laboratory in March 1953. While in the laboratory, he served as a member of the mill technical service. In September of 1960, he was appointed assistant general superintendent, wax production department.

I-P Names Silvernail to Newly Created Post

Curtis V. Silvernail has been named assistant to the manager of the department of Service and Quality Control of International Paper Co.'s Fine Paper and Bleached Board Division.

Mr. Silvernail will serve as assistant to Oscar E. Anderson in providing technical services and maintaining quality control for this sales division. A 1949 graduate of Auburn University, Mr. Silvernail joined International Paper at its Research Division in Mobile in 1950. He later served at the company's Louisiana mill in charge of quality control and development.

In his last assignment, he was assistant manager of the Cali, Colombia, bagasse paper mill which IP operates with W. R. Grace.

KVP Sutherland Combines Personnel Departments

The Personnel Departments of KVP and Sutherland Divisions, KVP Sutherland Paper Co., have been combined under Donald C. Smith, manager of administrative services.

Since joining the Sutherland Division in 1952, Mr. Smith has held the positions of employment manager, employe services manager, and personnel manager. He was named manager of administrative services in 1960. Mr. Smith is a graduate of Kalamazoo College.

Charles Hammond will be personnel manager for the combined operation. Appointed personnel manager for the Sutherland Division in 1960, he has previously been employment supervisor and personnel representative. Mr. Hammond graduated from the University of Michigan and was assistant personnel manager for St. Regis Co., Panelyte Division, before joining Sutherland in 1953.

Burnell Long will continue as labor relations manager for Sutherland Division, and Donald Hawley will be labor relations manager for KVP Division. Both will report to Mr. Smith.

Reporting to Mr. Hammond will be Howard Ginter, employe services manager; Jack Hartleroad, safety director; Jack Kari, wage and salary administrator; Joe Pivonka, employment manager; and Ken Rowland, director of training and communications.

O. T. Dalley

Celgar Names Dalley Gen. Supt., Pulp Mill Div.

Owen T. Dalley has recently been appointed general superintendent at Celgar, Ltd., Pulp Mill Division.

Graduating from Canterbury University, with a B.S. and M.S., Mr. Dalley entered the heavy chemical industry in Australia as a process engineer and later spent seven years in the Technical Department of New Zealand Forest Products, Ltd.

In 1956 he emigrated to Canada and spent three years as laboratory supervisor and process engineer with the Marathon Corp. Following this he became senior technologist of pulp mill process controls for the Champion Paper & Fibre Co. in North Carolina. In July, 1960, Mr. Dalley accepted the position of technical superintendent with Celgar, Ltd. He has served in that capacity up to his present appointment.

Miller Completes 50th Year in Paper Industry

Miller Cardboard Corp. has announced the completion, by Mark Miller, president, of 50 years of active service in the paper industry. Mr. Miller organized the paper merchant firm in 1927. Prior to that he had been employed by American Writing Paper Co. and by other large paper companies in sales positions. He also spent several years in the Far East representing American Paper Exports, Inc., an association of American Paper Mills.

IT'S HARD TO HIT A MILL *ANYWHERE* WITHOUT DeZURIK REGULATORS!

In hundreds of mills, thousands of DeZurik Consistency Regulators keep proving DeZurik's dominance and excellence in stock-consistency control. Today, backed by over 30 years of partnership with paper-makers everywhere, DeZurik engineers can and will recommend for any situation the exact regulation-installation which will positively assure the utmost in efficiency, accuracy, sensitivity, longevity. DeZURIK CORPORATION — Sartell, Minnesota; or DeZURIK OF CANADA LTD., Galt, Ontario.

NEWS OF CONVERTERS

Kupfer Bros. Forms Consumer Products Div.

Kupfer Bros. Co. announces the formation of its new Consumer Products Division, devoted to the manufacture of household use paper products. Sales for the division will be headed by J. M. Altman and production will be headed by W. A. Roehm.

The division's equipment, mostly of special design and construction, has now been completed for its initial products and production is commencing at full production rates. The first items to be released for marketing will show unusual and greatly improved modes of packaging while several completely new products are only awaiting completion of special equipment.

Kupfer Bros. Co. is a major and old established manufacturer of coated, printed, embossed and decorated papers for packaging, book binding, gift wrapping, box covering, etc., and also makes imitation leather papers. The formation of this new division is one step in the recently approved program of expansion of the company.

BPCI Sponsors Second Annual Conference

The Second Annual Conference on Containerization and Packaging will be held in the Skytop Room of the Statler Hilton Hotel, New York, N. Y., on January 18, commencing at 9:30 A.M. The conference theme will be: The Distribution Count-Down in 1962.

The conference is sponsored by Bulk Packaging and Containerization Institute which aims to provide coordination for executives responsible for transportation, physical distribution and related packaging developments.

Seven well-qualified authorities will discuss the recent progress in containerization for both domestic and overseas freight, and the very latest types of equipment and facilities. Modern leasing plans which eliminate return problems will also be described. Advantages of a through bill-of-lading from inland locations to overseas customers will be outlined. The "third level in 1962" with actual case histories will be presented as a means of making containerization more appealing.

Registration including forenoon and afternoon sessions and luncheon should be mailed in advance to Bulk Packaging and Containerization Institute, P.O. Box 3444 Grand Central Station, New York 17, N. Y. Single registrations are $20.00 each. Two or more persons registering together from the same company $17.50 each.

Custom-Made Installs New Bag Machines

The addition of three new bag machines was recently completed at Custom-Made Paper Bag Co. of Long Island City, N. Y. A special Model 94 machine joined two Potdevin Model 101 machines installed two months earlier.

"The purchase of the two 101's," remarked T. J. D. Dunphy, president, "was made to meet the continued demand for ice cream bar bags, particularly of the heat-seal variety, despite the growth of our wrapper business." The 94 machine will be used for a variety of specialty bags.

Dennison Promotes Two In Machine Systems Div.

Appointment of Frank T. Gerould as manager of the Machine Systems Division of the Dennison Manufacturing Co., Framingham, Mass., was announced recently. He was formerly national sales manager of that division.

Mr. Gerould, a graduate of the University of Nebraska, joined Dennison in 1956 as a merchandise assistant. He became merchandise manager of the Machine Systems Division in 1959, and later the same year was appointed national sales manager.

William J. Collins, formerly sales manager of the Philadelphia district for the Machine Systems Division, has been appointed national sales manager to succeed Mr. Gerould. He will be located at Framingham.

Mr. Collins came with Dennison in 1940 as an accountant. He was appointed section chief in 1951, transferred to the selling organization in 1953, and became district sales manager in 1958. He is a graduate of Northeastern University.

Two Advance at Cons. WP&P Paperboard Products

The Paperboard Products Division of Consolidated Water Power & Paper Co. has named Bert Joling foreman of the division's Tube Department and appointed David Marceau to the new position of in-line carton foreman.

Mr. Joling joined Paperboard Products Tube Department in 1942 and has been serving as a winder operator. Mr. Marceau began at the division in 1946 and has worked in the Carton Department continuously since that time.

Container Corp. Promotes Dalton

Macon M. Dalton has been appointed district general manager of the Philadelphia and New Brunswick, N. J., shipping container plants of Container Corp. of America.

Mr. Dalton formerly was general manager of the Philadelphia plant and will continue to make his headquarters there.

Textile Paper Products Ups Raymond and Knight

Textile Paper Products, Inc., has named R. J. Raymond general manager of the Cedartown Division and Curtis Knight as superintendent of the Cedartown plant.

Mr. Raymond came to Textile Paper Products from the Richkraft Co., Chicago, where he was assistant sales manager. He was previously vice president and general manager of Giffen Building Specialties in Coral Gables, Fla.

Mr. Knight joined Textile Paper Products in March 1960 and served as assistant superintendent of the firm's Crossett, Ark., plant. Before joining Textile Paper Products he was connected in sales and industrial engineering capacities with two Monroe, La., firms, Monroe Bearing and Supply Co., and the J. B. Beaird Co.

Another example of "Virginia" nationwide technical service

THIS STILL BLEACHES A TON OF PULP

A paper pulp mill recently took us up on our claim that single-stage pulp bleaching can be done with zinc hydro for $6 a ton at tops, including chemicals and steam. A few months later we got an indignant complaint. Costs were running well above $6. We checked our records. The mill's purchases of hydro seemed high. We sent a technical service man around on the run, and he found the answer fast. The operator, overlooking the importance of air-free mixing, was simply dumping the zinc hydro upon the pulp. Though more stable than sodium hydro when exposed to air, the zinc hydro was degrading far too rapidly under this careless handling. The "Virginia" man showed the operator how to prepare the bleach solution properly, how to add it to the pulp slurry as close to the agitator as possible to get quick, thorough, air-free mixing. A check of the bleached stock retention chests at the end of the reaction time showed the pulp to be at the proper brightness level. Consumption of zinc hydro—normal. Cost—down to well below the conservative $6 per ton we had claimed. For more information on bleaching with hydro—or to arrange for a free mill trial—write, phone or wire Chemical Division, VIRGINIA CHEMICALS & SMELTING COMPANY, Dept. 213, West Norfolk, Va.

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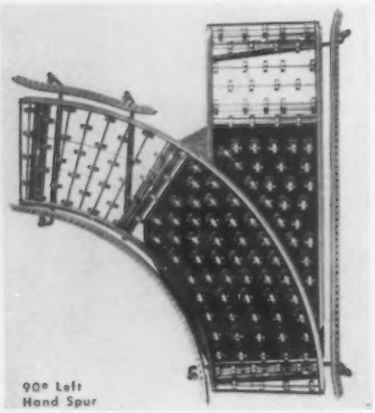
PJT NEW EQUIPMENT & SUPPLIES

Converging Spurs for Conveyors Need No Switches, Controls

Conveying items from two lines onto one line can now be done without the necessity of manual or elec-



trical switch controls with the neutral converging spurs and 'Y' curves made by The Rapids-Standard Co., Inc., Grand Rapids, Mich.

The Rapistan units' low price and portability make them ideal for merging orders collected on two lines and conveyed into a truck or rail car. Articles move over the units on swivel casters mounted on the unit plate. Casters are self-adjusting to line of travel.

Units are available in 45 or 90 degree-turn spurs or 'Y's. Spur units are made for 12, 18, and 24-inch-wide conveyors. 'Y' units are for 12 and 18-inch-wide conveyors.

Complete information on converging spurs and 'Y' curves is available from The Rapids-Standard Co., Inc., 144 Trowbridge St., Grand Rapids, Mich.

Improved Latex Used Without Stabilization

An improved styrene-butadiene latex, designed specifically for the paper industry, to give significantly lower viscosities in coating formulations, is now being made commercially available by the Plastics Division of Koppers. The product is called Dylex K-54W, and is an improved version of Dylex K-54.

In a typical offset formulation at 57.5 per cent solids, Koppers claims that the viscosity was reduced from 11,000 centipoises to 4,000 with the use of this latex. Similarly, the coating color viscosity was reduced from 6,500 to 5,000 centipoises in a typical letterpress formulation at 66 per cent solids, according to the Koppers Company.

This reduction in viscosity allows the increase in the solids content of the coating color while maintaining a desired viscosity level; thus, reducing the amount of water which must be removed by the dryers.

The achievement of lower viscosities has been accomplished without sacrifice of any other properties, Koppers claims, adding further that Dylex K-54W has outstanding mechanical stability plus good compatibility with pigments and starch. The company recommends that the product be used without stabilization.

Improvements indicated in the finished coated sheet include increased smoothness, high pick resistance and wet rub resistance, Koppers says. In addition, they say that this latex creates no unpleasant odor in the mill and leaves no residual odor on the coated paper. Koppers Co., Inc., Plastics Division, 901 Koppers Building, Pittsburgh 19, Pa.

pH Buffer Compounds In Powder Form

Certified buffer powders for preparing standard solutions for pH measurements, have just been introduced by Coleman Instruments, Inc.

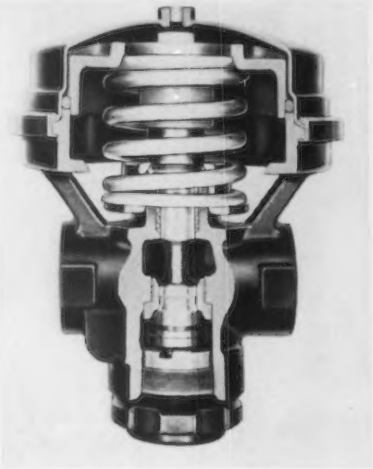
The powdered buffers permit the rapid preparation of a convenient amount of buffer solution merely by adding the chemical formulation contained in a single packet to 100 ml. of distilled water.

Coleman Certified Buffer Powders are available in four pH values—2.0, 4.0, 7.0 and 10.0 pH. The formulation in each hermetically-sealed packet is certified to produce a buffer solution within 0.01 pH of its stated value. The buffers are supplied in packages of ten packets of a single pH value or in assorted values.

A sample assortment is available from Coleman Instruments, Inc., 42 Madison Street, Maywood, Ill.

Cylinder Operated Valves Light-Weight, Fast Acting

Lightweight, fast-acting actuators have been combined with ductile iron bodies in the Taylor 1000V Series of Cylinder-Operated Valves. The one-piece stem and disk construction is made of Monel metal. A positive, leak-proof seal is provided by using a series of Teflon rings compressed against the stuffing box wall and the



stem surface. A stainless steel spring mounted on a self-aligning packing gland to eliminate side thrust provides spring loading for the packing rings.

The low coefficient of expansion of the iron body and spider greatly is said to reduce leaks in the stem packing and minimizes the annoyance of loose seat rings. The cylinder is made of anodized aluminum. The cast aluminum piston with a Teflon coated wall moves within the spider casting to eliminate malfunction due to external cylinder damage. The minimum travel time of the valve piston is less than a fraction of a second.

Valves are provided for either two or three-way operation. The rated service pressures are 300 or 500 p.s.i., and the valves are available for cold or hot hydraulic service up to a maximum temperature of 400°F. Taylor Instrument Companies, Rochester 1, N. Y.

Controls and Records pH Automatically

New Brunswick Scientific Co. has developed an automatic pH controller which regulates, monitors, and records pH in any chemical process, at laboratory, pilot-plant and production levels. It has its own indicating pH meter and strip-chart recorder inte-

(Continued on page 50)

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Which Size Press Roll Should Be Driven?

And where should the rubber covered roll be located?

Egon N. Kornicer,
Technical Director,
The Patton Manufacturing Co.

Mill experience with size press rolls is at odds with "common sense" in several areas. Some mills that use the rubber roll as the driver report far less roll wear than those using the hard roll as the driver. Other advantages in using the rubber roll as driver are in the more efficient use of necessary power and freedom from helper drives in many cases. A properly designed helper drive may solve many size press problems, however, where high speed and slippage are encountered.

The question of whether to drive the rubber roll or the hard roll on a size press has been raised many times. According to common sense it should make no difference since both rolls are the same diameter, but in practice many mills can prove there are important differences. Since the answer to the question affects expenditures of thousands of dollars, it is worth while to examine the behavior of size press rolls under various drive arrangements in common use.

Roll Radius Not Important

Figure 1 shows the effect of applying nip pressure to a rubber roll and a hard roll. Radius **R** of the hard roll does not change. Radius **r** of the rubber roll decreases as nip pressure increases. Common sense would indicate that the rubber roll with its smaller **r** would turn faster when driven by the hard roll. In actual practice, however, the rubber roll turns slower than the hard roll.

Under nip loading the surface of the rubber roll is deformed. The elastomer stretches to create a greater circumference than the original circumference prior to deformation. It is the number of **surface feet traveled** (circumference) that determines the number of revolutions of the rubber roll. Radius calculations cannot apply in any valid way to a deformed rubber roll since it is not concentric.

The principle may be grasped easily by measuring the length of a rubber bar when its two opposite long sides are compressed. Its end-to-end length increases.

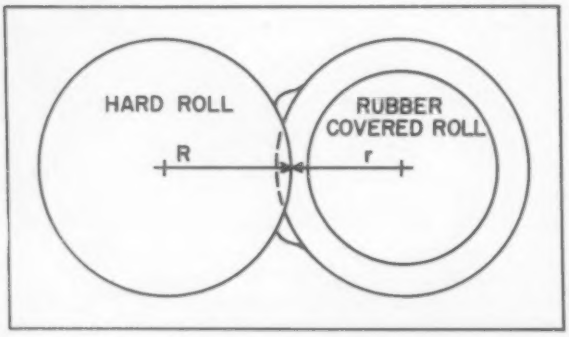


FIGURE 1 — When hard and rubber covered rolls of same diameter are brought together under static pressure, resulting deformation reduces the radius of the rubber roll and radius calculations do not apply.

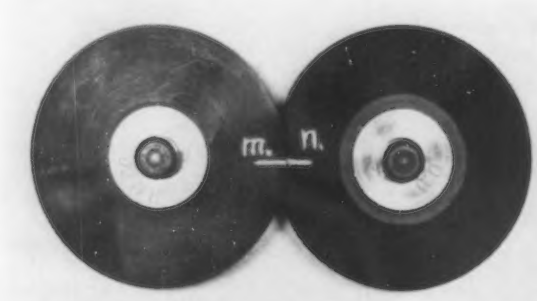


FIGURE 2 — Experimental set-up shows the position of two points at a given instant in time.

Drive Mode Affects Circumference

The fact that increased nip pressure stretches the rubber roll surface and thus affects speed has other implications. Most important is the way in which the deformation is generated and the amount of deformation in linear terms. Both are a function of how the rolls are driven.

To demonstrate the phenomena an experimental setup has been constructed, (Figure 2). A hard roll and a rubber roll are held in a fixed relationship with each other. (An extremely soft rubber roll is used in the experimental unit to exaggerate the results of the demonstration. This makes it easier to see differences between the tests.) An arbitrary nip pressure results from the spacing selected. Both rolls are free to turn when a hub is twisted with the fingers.

In Figure 3 the effect of static loading deformation is shown by the lines at the right of the drawing. Line A represents the circum-

ference of the rubber roll prior to deformation. Line **B** represents the circumference of the rubber roll under static loading. Line C represents the circumference of the hard roll both before and during the application of nip pressure. Note that static pressure alone increases the surface length of the rubber roll, and would cause it to rotate slower than the hard roll.

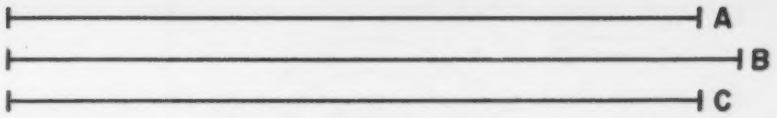


FIGURE 3—Lines represent the circumference of the rolls under various circumstances: A = circumference of rubber roll before deformation. B = circumference of rubber roll deformed. C = circumference of hard roll in both cases.

Dynamic Example

The static example proves the point but a dynamic example is necessary to examine the differences in the effect of using the rubber roll or the hard roll as the driver. In Figure 2, marks **m** and **n** are on line with each other just prior to start-up. In Figure 4 the hard roll has been twisted one revolution. The results here are analogous to the effect of using the hard roll as the driver in a size press. Note the difference in the positions of marks **m** and **n.**

In Figure 5 the rubber roll has been twisted one revolution, and the situation is analogous to the effect of using the rubber roll as a driver on a size press.

The difference in the circumference of the rubber roll is a function of the kind of deformation generated by the method of driving. When the hard roll is the driver it **stretches** the rubber surface as it pulls it through the nip, thereby increasing the surface distance traveled on the rubber roll (Figure 6). When the rubber roll is the driver, it first **compresses** its own surface length, then **stretches** it as it passes through the nip (Figure 7). The result is that the difference in speed is smaller when the rubber roll is the driver because of this virtually instantaneous compression-then-expansion versus simple expansion alone. In other words the net length of the stretch is less when the rubber roll is the driver because the surface is in a compressed state just prior to the instant that stretch takes place.

These simple experiments demonstrate several underlying principles of size press design and operation that can have a profound influence on the results with which existing size presses are operated. The basic principles are:

1. The speed of a rubber roll is dictated by its effective circumference in the dynamic and deformed state rather than its diameter or radius prior to loading.

2. When the hard roll is the driver there is a greater difference in roll speed than when the rubber roll is the driver.

3. The difference in speed is not subject to simple mathematical analysis since it encompasses so many variables (nip pressure, rubber hardness, horse power, speed, temperature, etc.)

Effect of Rubber Roll as Driver

Disregarding the possibility of slippage between rolls, it takes the **same** amount of power to drive a size press regardless of whether the rubber roll or the hard roll is the driver. The essential difference is in the amount of power that must be **transferred through the nip** by means of surface friction between rolls, to drive the undriven roll. For example, assume it takes seven h.p. to drive a size press. Assume that bearing friction of the hard roll uses two h.p., that bearing friction of the rubber roll uses two h.p. and that three h.p. is consumed in deforming the rubber at the nip.

If the rubber roll is the driver, two h.p. is used to overcome its bearing friction, three h.p. is used to deform the rubber surface, and only two h.p. is transmitted through the nip to overcome the bearing friction of the hard roll. Since the rubber cover is bonded to the driven core, the three h.p. required to deform the rubber is **not** transmitted by means of surface friction between rolls. If the **hard roll** is the driver, two h.p. is used to overcome its bearing friction, three h.p. is transmitted through the nip to deform the rubber, and two more h.p. goes through the nip to overcome the bearing friction of the rubber roll. In the first arrangement only two h.p. is transmitted by means of surface friction between rolls; in the second arrangement five h.p. is transmitted.

Hence more horse power goes through the nip when the hard roll is the driver than when the rubber roll drives. The more power transmitted through the nip, the more wear on the rubber roll, and greater possibility for slippage. Thus it is possible to understand why more wear is caused on the rubber roll when the hard roll is the driver,

FIGURE 4—This arrangement shows the result of turning the hard roll one revolution clockwise.

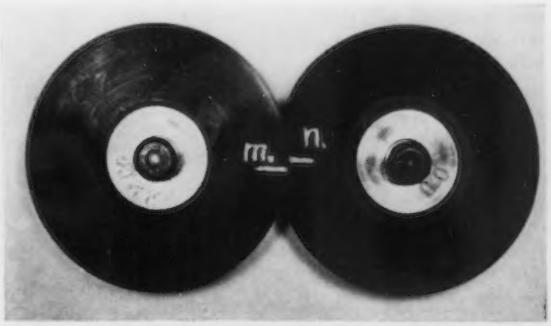


FIGURE 5—Point "m" and "n" were opposite each other and the rubber roll was turned one revolution counter-clockwise.

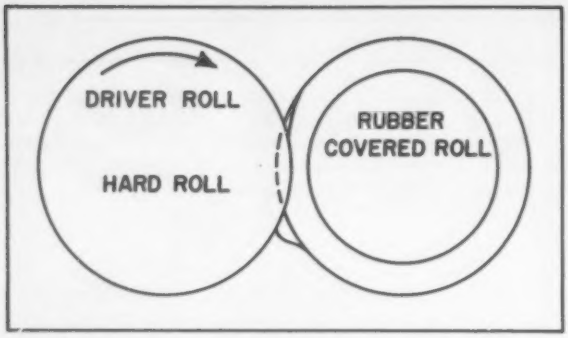


FIGURE 6—Drawing shows schematically how the rubber surface is stretched when the hard roll is the driver. Compression bulge at the bottom of the nip does not alter surface length.

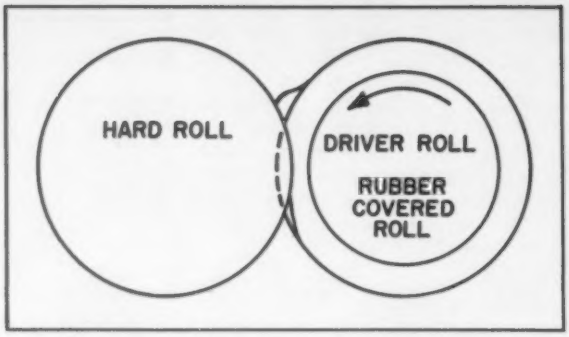


FIGURE 7—Effect of the rubber roll as the driver. Bulge at top of the nip represents compression of the rubber surface and stretching takes place as the compressed rubber is pulled through the nip.

and why the rubber roll suffers least when it is the driver.

One mill official reported that they regularly ground the size press rubber roll every week until they switched to using the rubber roll as the driver. This change has resulted in lengthening the time between grinding to three months, at a substantial savings in money.

Helper Drive Considerations

Speed differences between rolls and the differing power requirements make it important to consider helper drive design carefully. Only the speed of the hard roll can be predicted and measured in regard to the paper speed. The rubber roll surface speed or r.p.m. for helper drive purposes, cannot be predicted accurately. This fact has been amply demonstrated when attempts to use a positive drive between rolls has been tried. Results have been poor, involving breaking of chain links, stripping of gear teeth, excessive roll wear, and other headaches.

Mill experience is in favor of placing the rubber driver roll on the wet end and the driven hard roll on the dry end of the size press. While many mills find a helper drive unnecessary with this setup, a few prefer to use one.

The presence of slippery size tends to reduce the coefficient of friction between rolls allowing slippage—even to the point where the rubber roll may stop completely during a sheet break. This is more apparent where the hard roll is the driver because a greater amount of horse power is being transferred through the nip by friction, and hence a greater amount of horse power may be lost through slippage. A properly designed helper drive will prevent this slippage and will extend the life of the rubber covering as well.

Helper Drive Design

To handle differential speeds, a size press helper drive may use slip belts, a d.c. motor, eddy-current clutch, hydraulic motor or any constant torque drive. Constants for sizing a helper drive are not established. Experience indicates that approximately 25 per cent of the normal horsepower needed to drive a size press, will be adequate for a helper drive to eliminate slippage.

When it is required to accelerate the speed of the helper driven roll with the nip open, the capacity of the helper drive has to be checked in accordance with WR^2 formula to assure that desired acceleration time is achieved. Many otherwise troublesome size presses can be made to operate relatively trouble-free by either adding a helper drive, or replacing an improperly designed helper drive.

On new size presses, however, it is best to specify the rubber roll as the driver in order to gain maximum rubber roll life. Furthermore, the rubber roll should be located on the wet end of a size press. With such an arrangement no helper drive will be needed in many cases. Or where high speeds dictate a helper drive regardless of other considerations, the savings in roll wear will still be significant when the rubber roll is the driver.

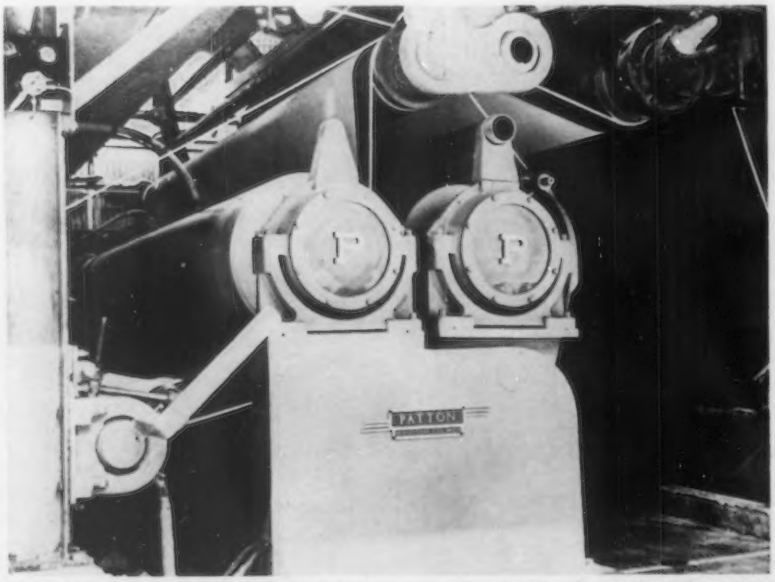


FIGURE 8—Typical modern horizontal size press has hard roll on the left, rubber covered roll on the right. Wet end is at right.

Felt Application in Bleached Kraft Fourdrinier Board Manufacture

Felt cleaning, shadow marking and needled felts were among major topics of discussion covered by representatives from board mills in Canada and the U. S. at . . .

. . . a recent two-day round table meeting held by the Albany Felt Co. in Albany, N. Y. Larry Woodside, chief engineer, technical field service at Albany Felt, moderated. Planning was developed by Samuel C. VanPraag, sales manager, and Robert D. Gregory, Jr., assistant to the sales manager.

Felt Cleaning and Conditioning

A midwest mill superintendent stated they had considerable success in cleaning felts by having a nozzle apply a small quantity of water to the felt from the opposite side of the felt to the Vickery shoe. Basically, this amounts to the equivalent of a traveling suction box and shower arrangement, and it was pointed out by a number of superintendents and felt technicians that there seems to be a definite trend toward this felt cleaning arrangement. This same mill applies the cleaning solution at 120°F. with seven pounds of detergent mixed with approximately 250 gallons of water per eight-hour period. This is metered to the Vickery shoes. All three felts on this 218 inch-wide machine are cleaned in this manner. The felts remain soft and open and are removed only when they are completely worn out. In this case the machine speed ranges from 250-900 f.p.m.

It is Albany Felt's feeling that an outside suction box or Uhle box with smooth lips and an inside preceding shower is one of the best possible arrangements to clean a felt properly. It was also suggested a fine spray-mist can be applied to the felt to lubricate it and minimize the wear caused by suction box dependence on the type felt being used.

The superintendent of a northern mill making food board stated he had been running felts in the "common wet" classification and had been receiving approximately 30 days' life with no cleaning equipment of any kind. This mill coats the top of the sheet and has no finish problems at all. Felts are removed because they lose cushion and are compacted.

In describing the cleaning arrangement on one of his machines, a superintendent indicated that rods used for the lips of the Uhle box were monel metal and that the diameter of these rods is critical as far as felt wear is concerned. This dimension has a direct bearing on the angle at which the felt is sucked into the box. Wear can be minimized by proper adjustment.

It was agreed that suction hole filling and felt filling go hand in hand. The feeling was expressed that once a suction roll is drilled it will continually fill, and redrilling is a constant problem. Suction roll cleaning by means of a high pressure needle shower with a diameter slightly smaller than the suction holes was declared to be very successful. Use of this shower arrangement once a day is usually enough to keep the roll in good operating condition.

Wet Strength Resins

The consensus was there always seems to be trouble with filling caused by wet strength resins. However, one superintendent mentioned he uses a wide range of wet strength from high to low percentages and has never been able to blame the failure of the felt on the wet strength resins.

Another superintendent mentioned that in order to keep felts clean they wash as soon as a wet strength run is completed. Albany assistant chief chemist Sweet emphasized the importance of starting felt washing very early in life and staying with it continuously. If continuous washing is not feasible then an intermittent shutdown wash is essential. A paper mill manager from the south mentioned they use continuous washing successfully.

Another superintendent reported running wet strength grades three or four days at a time, then shutting down to wash felts for about one hour. He used a solvent very similar to kerosene and followed with a plain water rinse and then a 50 per cent muriatic acid rinse. He declared this really kept the felts clean and did not shorten the life, much to the surprise of all the participants including the Albany Felt Co. technicians.

Third Press—Shadow Marking

Larry Woodside asked if the third press position was the most important factor in achieving good finish. He further questioned if most of the marks (shadow and yarn) could be eliminated by careful manipulation of the weighting and heat (if preceded by dryers) at the third press. He stated the theory had been expressed that sufficient weighting of a plain press following a suction press will eliminate shadow marking. A superintendent from Michigan did not agree with this theory and said it would perhaps aggravate the shadow marking condition. A Canadian superintendent said this would not necessarily help, and in some cases, would make it worse.

A superintendent from California described a third press position with a steel roll used as a smoothing press with no weighting. He said it seems to do the job. The sheet is about 65 per cent wet at this time.

Albany assistant chief designer W. S. Wightman displayed a 25 lb.

M.G. sheet made on a Yankee machine running at 550 f.p.m. This machine has a plain grooved couch, a suction press and a plain pressure roll. The suction press roll is rubber covered, plastometer 30 and drilled holes 1/8 inch diameter. This was a base sheet before coating and there was little evidence of shadow marking near the deckle edge, but it was very evident near the center of the sheet. This may be caused by uneven nip pressure resulting from improper crown. A sample of this 25 lb. M.G. sheet with a coating on one side was then shown and the shadow marking was even more evident.

Mr. Wightman then distributed three samples of food container board made on a three-press fourdrinier; the first and second presses being suction, the third press being plain. The first sample, taken after the second suction press, clearly showed the drilled pattern of the suction roll; also, wire and felt marks. The second sample, taken after the smoothing press following the third plain press illustrated the drilled pattern was almost completely ironed out. Wire and felt marks were reduced. The third sample showed the wire side of the finished board with the shell mark completely eliminated. This illustrated that shadow marking can be eliminated by pressing the sheet after the suction second press remained down, the results were the same, except that the marks were worse. The machine was then run with both presses up. The marks could not be seen at the couch, although samples taken from the wet end did show them. This is without any calendaring. The marks did disappear in drying. During this process of making machine changes, granite top rolls were replaced by rubber covered rolls and this helped, but not to the desired degree. It was stated shadow marking is a pressure mark and is almost impossible to eliminate.

Technical director Stuart Engle asked if any of the papermakers had eliminated shadow marks by reducing the diameter of the drilling in the suction rolls.

A superintendent from Canada said this had been done on their dual press, and was a help. The roll roles were reduced from 11/64 to 9/64ths. A number of superintendents indicated they had made similar changes with satisfactory results. It was stated the bigger the holes, the greater the shadow marking. A superintendent from Washington believed the way to stop shadow marking was to change the felt. Another superintendent agreed that shadow marking was decreased by a reduction in the size of the drilled holes. A superintendent from Michigan commented that by reducing the size of the holes you are actually reducing the size of the shadow marking impression.

In a few cases reduced hole size and softer roll covering in the fine paper manufacture has been beneficial in alleviating the problem. It was mentioned that on tissue machines with drilled pressure roll where no vacuum is used, shadow marking can occur. This seems to substantiate the pressure theory.

"Thus far needled felts have found their best application on the bottom position of cylinder machines where the primary advantage has been improved finish and life."

presses with a plain press and/or a smoothing press.

Is shadow marking a major problem on food board? asked Larry Woodside. Four superintendents replied this is not a problem. Others said it was of concern, but not of primary importance.

A Canadian superintendent described a number of steps he had taken to check on shadow marking with little success. He is able to lift the press rolls and still keep the sheet on the reel. By lifting the second press he gets shadow marks from the first press. On a 30 lb. sheet and lighter, they are very evident. On a 60 lb. sheet and heavier they can be seen only on the bottom side of the sheet. When the first press was lifted and the

Dual Press Wrinkles

A Canadian superintendent mentioned a problem once experienced with a dual press. They had been told by a machine manufacturer not to use more than 10 inches of vacuum but they did try up to 15 inches. Experience indicated that when they went down to 10 inches they got wrinkles. In order to eliminate the wrinkles, they had to tighten up the felts. They further discovered the rolls were very soft, and pulled the sheet into the nip. Without replacing the roll, they corrected the problem by putting in a paper roll ahead of the press.

Inverse Pressing

The question was asked if inverse second presses are considered a good installation from the standpoint of water removal as well as improved finish. Two superintendents said they could not do without inverse suction second presses. Another said he found significant improvement in water removal, but could not say definitely that it helped or hurt finish.

One participant exclaimed that the inverted suction second press was not a good installation and another said the long draws between the presses can cause breaks. Felt filling is another problem.

Needled Felts

A discussion concerning Durasorb or needled felts was requested. It was explained a needled felt consists of a woven base fabric into which a loose web of carded fibers is inserted by the needling process.

It was explained that one of the advantages of the needled felt is its ability to drain water. This is because of the orientation of the web which is needled perpendicular to the base fabric. These fibers act as a wick and allow the water to drain through the felt. Another advantage often found when using needled felts is improved finish created by the smooth felt surface.

The third advantage is life increase. Life in most cases has been improved; in some cases, to a remarkable degree, because of the additional protection afforded the base fabric by the web. Thus far, needled felts have found their best application on the bottom position of multicylinder board machines where the primary advantage has been improved finish and extended life.

On bleached board machines experience has been somewhat limited because of the width requirements which at first exceeded manufacturing capabilities. These limitations have now been eliminated. Fiber shedding difficulties also held back

"If a felt is removed because it is becoming hard or boardy, it is unwise to increase or incorporate synthetics in it."

the development of needled felts for these grades, but improved manufacturing techniques and specially developed chemical treatments have brought this problem under control.

It was stated that a Durasorb Felt in the "Fine" classification weighing approximately three ounces per square foot was run with good results on a bleached board machine second suction press position which normally used a plate felt in the same weight. Shadow and yarn marking, along with felt filling, had created severe problems on this machine. The needled felt reduced the shadow considerably, and practically eliminated the yarn marks. Normal life with a plate felt was eight days, and at that time the felts would become hard, boardy and filled. The needled felt was removed at the scheduled eight-day shutdown, but still had good resiliency and probably could have run four or five more days.

Because of recently developed special finishing techniques and chemical treatment, fiber shedding is no longer a problem for food board needled felts. Needled felts cannot be run without good conditioning equipment.

In the beginning of the needled felt development it was the thought to increase the weight of this felt by five or six per cent over the weight of conventional woven felts. However, thinking has changed. Thus, in some cases, the weights of the needled felts are a little lower than that of woven felts. Albany does not make Durasorb felts the same manufactured size as conventional felts.

Synthetic-Content

The question of the effect of synthetic-content in felts evoked considerable interest. It was stated that in adding synthetic to felts, with no other changes, the felts will usually run slightly closer. The more synthetic added, the closer the felt may act in operation.

Some mills can handle up to 25 per cent synthetic-content and have no ill effects. Others cannot use nearly this high a synthetic-content. One superintendent objected to the use of synthetic since he said he would not run one day longer with a synthetic felt than he could with an all-wool felt and, of course, he pointed out the felt cost with synthetic was higher. Technical director Engle stressed that synthetics should be limited so that their use is justified (to combat frictional wear and stretching problems). He pointed out that if a felt is removed because it is becoming hard or boardy, it is unwise to increase or incorporate synthetics. In cases such as this when the felt gets older the synthetic-content associated with filling will cause marking.

Edge Wear

In order to alleviate the problem of edge wear a superintendent from Michigan remarked that he uses a secondary crown. It is not necessarily a step dub. On the press rolls they go in about three inches and cut 3/16 of an inch deep.

It was mentioned that many mills with suction rolls have drilled beyond the suction area in order to provide a place for the water to go. Service engineer William Shires said he had visited a number of mills where wear was taking place in the drilled area. Sometimes the cut is too deep and the edges become sharp, causing excessive wear.

Fiber Shedding

All felts shed to a certain degree because of mechanical and chemical degradation and one of the problems felt manufacturers face is to be sure they receive enough information from the paper mills to indicate whether action to minimize the shedding condition is necessary. If fiber shedding is a problem, the customer should let the sales engineer know about it so corrective measures can be taken. Mr. Engle explained that over a period of years Albany have devised in manufacturing certain procedures which we can be resorted to in order to minimize fiber shedding. Some of the many problems associated with "on-machine-coating" were discussed, and it was stated that with special handling techniques and the use of chemical treatments, shedding can be controlled to a certain extent by the felt manufacturer.

It was said that in addition to special finishing techniques we could, in some cases, resort to the use of finer wools which will full tighter and cut down on the available fibers. A felt with a resin treatment will hold these fibers together better than one without such a treatment.

"Hey, Mac! You're job ended at the stacker mill."

New Dryer Felts

Frank Clawson, president of Paper Mill Suppliers, Inc., Kalamazoo, Mich. was asked to discuss the advantages of the new synthetic dryer felts produced by Albany Felt Co. for which he is the exclusive distributor.

Mr. Clawson stated that Albany Felt "Dri-Tuft" needled dryer felts represent a departure from the conventional woven dryer felt. Field results have shown excellent stability, no stretching, no narrowing or difficulties in guiding. No deterioration because of water damage has been experienced and tensile strength is improved. These felts have shown high resistance to a number of common mill accidents and hazards compared to standard cotton asbestos dryer felts.

He declared that Dri-Tuft felts run up to triple the life of conventional dryer felts, and in addition, drying has been improved and steam costs reduced at a number of mills. He further remarked oil and grease will not damage needled dryer felts nearly as much as other constructions. Mr. Clawson declared that until a short time ago there had been virtually no progress in the dryer felt industry in regard to the type of felt design, and the new designs are a definite advance toward the development of improved, better-performing dryer felts.

Acceptance Sampling in Fine Paper Finishing Operations

Report on the first meeting ever held devoted to this subject, so important to fine paper manufacturers. This is part of PTJ's continuing emphasis on finishing.

A one-day meeting on "Acceptance Sampling on the Fine Papers Finishing Rooms" sponsored by Finishing Sub-committee, Material Handling Committee, Technical Section CPPA, was held in Ottawa, on September 22, 1961. This included a mill visit to the E. B. Eddy Co. finishing room, where the delegates were able to see an application of Acceptance Sampling in use. Operating details were explained by qualified supervisors of the E. B. Eddy Co.

Luncheon was put on by The E. B. Eddy Co. and W. C. R. Jones, vice president of manufacturing of the company, welcomed the 65 delegates that included people from British Columbia through to New Brunswick and Minnesota to Maine.

The importance of Quality Control and what it means was discussed briefly by E. C. Gilbert, chairman of the Finishing Sub-committee.

The theoretical and practical approach to sampling plans was discussed by M. E. Blew, quality control manager, Strathmore Paper Co., West Springfield, Mass., and John Davies, finishing superintendent, The E. B. Eddy Co.

Details of the sequential sampling technique as used by The E. B. Eddy Co. were presented by Gordon C. Campbell, manager, technical department, The E. B. Eddy Co.

Resume of Acceptance Sampling

E. C. Gilbert.
Chairman, Finishing Sub-Committee,
Technical Section, CPPA,
Gilbert & Shields, Montreal

Quality control techniques are the results of the application of statistical methods to problems of controlling quality in industry and military procurement divisions. The word control being defined as: exercising, directing, guiding, or restraining power; to check regulate, or keep within limits: Thus, quality control denotes that quality will be controlled and kept within prescribed limits.

In the paper industry general recognition of the limitations of 100 per cent sorting have brought about the need for radical changes. Inspection methods also have a very pronounced effect on the integration of automation into the finishing operations. The limitations of older methods of inspection and the inter-relation of sorting with the flow of product to other operations in finishing have brought out two radical approaches to inspection: (1) sampling techniques; (2) mechanical and electronic inspection devices. Although the two methods are of great importance, for sake of clarity, only one method, sampling, was discussed at this meeting. (As soon as more information is available a similar meeting will be held on mechanical and electronic inspection devices).

To date, most of the sampling plans have been applied at the rotary cutters. This has developed not so much through intent but from trial and error. The impression is that as we become more and more sophisticated in the use of these techniques vs. the practical problems of an economical approach, further effort will be made to bring the techniques to papermaking. This would permit possible corrective action to be taken immediately before the run is finished on the paper machine.

What It Is

Acceptance sampling is a "Lot-by-Lot" type of inspection . . . The lot in most cases representing one finished platform of paper off the rotary cutter. Sequential sampling is a statistical approach to sampling to minimize the amount of sampling required while maintaining a predetermined reliability. The application of sampling permits a decision to be made through a minimum amount of quantitative data. The decision having been generated by the quantitative values of the sample, can be checked as to its accuracy through mathematical probability.

By the use of a multiple classification of defects into critical, major and minor, the control can be varied depending by the type of defect. Where specific customer requirements demand more than the average quality, the allowable per cent defective can be changed.

Simplification of sorting methods through the use of sampling techniques has certain inadequacies or errors. Modern statistics of mathematical probability permit the use of sampling plans that guarantee a minimum amount of inspection for a maximum amount of protection against sampling errors. Exhaustive tests have proven that the potential risk of permitting defective paper to be accepted, is well within normal customer requirements, and that even with these exceptions the average outgoing quality level is maintained. This is because the rejected lots are usually sorted sheet by sheet.

The formal approaches to quality control yield a great deal of impor-

tant data which otherwise would not be available. The intelligent use of this quantitative data on quality is of great value to all levels of management and can be as of as much importance to management as sampling is in itself towards improving the level of outgoing product and reducing the costs of inspection.

Summary Explanation

1. Regular sorting methods are very limited.

a. 100% sorting is usually too costly.

b. Fanning is not effective.

c. Most of the inspection costs are due to inspecting large quantities of good paper.

2. A formal approach demands the establishment of quality levels . . .

—Establishing the present outgoing quality level.

—Evaluating quality by customer requirements.

—Defining the acceptable level by type of defect and grade so as to eliminate the necessity of judgment.

3. A formal approach yields a collection of quantitative data for intelligent reporting which permits corrective action to be taken and a check to be made on this action.

4. All approaches of a sampling nature have improved quality and reduced costs.

5. Any approach to a more effective control of quality requires a thorough understanding of the theory involved and the practical aspects of papermaking. It is only through the combined efforts of the specialists and operating personnel that a realistic and effective plan can be developed.

The choice of a formal approach (to quality control) does not necessitate the acceptance of one method and the rejection of another; it calls for the finding of a blend of methods that is adapted to a particular set of problems and objectives.

Hammermills Quality Acceptance Sampling Plan

Roger M. Soth,
Manager, Industrial Engineering,
Hammermill Paper Co.

Paper has been screened traditionally by either the fanning or sorting methods. It had been standard practice at Hammermill to fan each ream five times (100 sheets per fan) on each of four sides. If the paper was marked for sorting, three methods were used, two of which required sheet by sheet inspection. We were screening our paper 100 per cent, but it was obvious from random checks that we were not getting 100 per cent acceptable paper even though we suspected that a high percentage of paper delivered to the inspectors was of acceptable quality. We analyzed the quality level and found the following before sorting:

Defective sheets due Paper Machine	2.5%
Defective sheets due Cutter	1.0%
Total Defective	3.5%

The analysis clearly indicated that: 96.5 per cent of the sheets delivered were free of defects. We employed 132 girls to search for the 3.5% containing visual defects.

A further study showed that fanning and sorting improved the quality of paper from 3.5 per cent to about .04 per cent defective.

When you consider all the variables in pulp and paper manufacture plus multi-cutter operation you begin to realize that a 3.5 per cent defective sheets is amazingly good.

Furthermore, we are finding and removing enough defective sheets to change the percentage of defective sheets 3.5 to .04. You also realize that the girls are doing a fine job under difficult conditions. However, our primary objective was to improve our average outgoing quality level.

The following two approaches were considered:

1. Increase the effectiveness of our sorting.

2. Install a quality acceptance sampling plan.

The first was rejected because all of our experiments showed that it would be difficult to improve the effectiveness of fanning or sorting without substantially increasing the cost because we still had to sort paper that was 96.5 per cent acceptable.

All the data that we collected substantiated the findings of the Wiggins Teape Co. and the E. B. Eddy Co. They are:

1. A girl complying with our standard fanning procedure can see only 60 per cent of the sheet.

2. Even if a defect is present in the 60 per cent "seeable area" there is a good chance that the inspector will miss it because of overlapping.

3. The job of fanning is fatiguing and monotonous. An average girl fans 115 reams in 7½ hours. This means she looks at 230,000 edges of 67,000 sheets while standing under glaring lights in a huge room full of distractions.

It became obvious that we could not economically raise our average outgoing quality level by standard sorting. We therefore turned to the second approach use of statistical methods.

Fundamental Principles

Basically, our sampling plan is a method of sampling at random a load of sheeted paper as it is being cut and by applying the sampling tables to the defective sheets found in the sampled paper, predict (within certain confidence limits) if the load or portion of the load of paper requires inspection or sorting. In other words, the system predicts statistically the amount of paper that contains a low level of defects requiring no screening, and the amount of paper that contains an undesirably high level of defects which must be screened for removal.

We sample by attributes; that is, each sheet sampled either conforms to certain specifications or it does not conform to those specifications irrespective of the number of defects contained in the sheet. In this system, the number of defective sheets in a sample determines the acceptance or rejection of a lot of paper rather than the number of defects found in the sampled lot.

Sampling by variables, although more accurate in the case of paper, is more cumbersome and complicated. Under this system sampling is accomplished by counting defects (not defective sheets) and the variables of sheet size, lot size and sample size, must all be considered. It can be done, but it is no easy problem with sheets of paper.

In order to make the system as simple as possible we chose the single sampling plan. Some paper mills use the sequential type which has some advantages, but it is much more difficult to learn and apply.

Our ultimate objective is to electronically reject defective paper at the cutters. In the meantime the Quality Acceptance Plan will continue to improve our quality level and reduce our costs! ! !

Quality Acceptance Sampling depends upon two important criteria:

1. Defects must be random, that is, they must not occur in concentrated or stratified areas.
2. Paper subjected to a sampling plan must contain a low degree of random defects.

The quality of our paper was high enough to satisfy condition No. 1, but we suspected that some defects were not random. It subsequently developed that our assumptions were right. Some defects are random, others are stratified, and still others such as splices and half sheets are what we call operational. Operational defects will always occur and can be marked when they do occur.

Since some types of defects are not random, we had to exclude them from our sampling plan. This is why a load of paper may contain areas of paper which need not be inspected or sorted, areas containing excessive random or stratified defects which must be screened, and areas which contain identified operational defects which must be removed.

The segregation of defective and nondefective areas within a load of paper is a deviation from the standard acceptance sampling technique, but one that we feel is necessary because of the nonrandomness of some visual defects.

How the Plan Works

A sampler is stationed at each cutter. Before the cutter begins cutting a new load of paper she notes the number of flagged splices and tear-outs in the rolls. When a new set is started she samples rapidly to determine when cutter wrinkles disappear. When the paper in the layboy is finally acceptable, the sampling plan begins. The paper on the load up to this point is marked as beginning of set and the paper in this area is either piled off for beaters or 100 per cent inspected or sorted at the jacks, depending upon the estimated yield.

We try to sample 150 sheets from each load out. This may involve removing one lift or several lifts at the same time, depending on the number of loads out, speed of the cutter, number of rolls cut and weight of the paper. In any event we try to get as many samples as possible regardless of the quality or other variables affecting the speed of cutting.

The sheets of paper removed from the loads as they are building up are placed on a table and sorted sheet by sheet as quickly as possible. When the load is finished the total number of sheets sampled and the number of defective sheets found are noted. Reference to the sampling table will determine whether the load is accepted or degraded.

As mentioned before, a load may contain degraded and acceptable areas. Operational defects such as splices, tear-outs and half sheets occur as part of paper machine and cutter operations. If marked properly the cutter sampler will know when they are coming through and can indicate their position in the load. They will then be removed either at the inspection stations or at the trimmer.

Stratified or nonrandom defects do not occur at random but suddenly appear, run for a short time and then disappear. Winder wrinkles, star wrinkles, etc., are included in this category. When stratified defects appear, they are not included in the determination of quality for the remainder of the load, but the area in which they occur is marked on the load and this area must be inspected or sorted on the jacks.

Improved Quality

There are certain risks associated with any quality acceptance sampling plan. There is the producer's risk where good loads may be degraded, and a consumer's risk where bad loads may be accepted. All the data we have collected to date show there is less risk with the Quality Acceptance Sampling Plan than with 100 per cent inspection.

Our experience has shown the average outgoing quality level (on a sheet or ream basis) of the paper accepted by the sampling plan is considerably better than the A.O.Q.L. of the paper 100 per cent inspected or sorted.

There are several reasons for this reduction:

1. The sampling plan removes the human element and fatiguing conditions to a large degree from the inspection and sorting operations and places it on a sound statistical basis.
2. Since there is less handling of the acceptable paper, there is less damage done to it.

But, what about the paper (roughly 30 per cent) which must continue to be inspected or sorted? We expect the yield from this paper to improve in quality also because:

1. The defective sheets are concentrated in a fewer number of sheets.
2. The samplers not only indicate on the Load Identification Ticket what the defects are, the number found by the sampler and where they are located in the load, but also place samples of the defects in the load to indicate their severity.
3. Splices, tear-outs and half sheets are marked in the load at the cutters by the samplers for removal either by the inspectors-sorters or at the trimmer.

Control of Manufacturing

It provides us with information we have never had before. We are not only able to determine which paper machines and cutters are producing defective paper in excess of the normal amounts, but we are able to tell what kind of defects they are and what crews are responsible.

We feel that feed-back of this information is vital to the success of any Quality Acceptance Sampling Plan since the average outgoing quality level varies directly with the quality level of paper delivered to the cutter layboy.

Reduction in Paper for Sorting

During sampling at the cutters, the samplers inform the cutter crews immediately when cutter or paper machine defects occur. Rolls containing serious paper machine defects are broken down and sent back to the Paper Mill. Cutter defects are corrected immediately. A significant reduction in the amount of paper marked for sorting has been obtained.

Improvement in Customer Service

The number of inspectors required has been reduced. This releases jacks for sorting. As a matter of fact, the inspectors now sort their own paper which eliminates piling down paper marked for sorting, moving it to the basement, sorting it and moving the yield back to the main finishing room floor for trimming.

Labor Savings

About 55 per cent of finishing costs is labor.

We now need fewer inspectors and sorters because the girls who are left do not have to look at 70 per cent of the paper which the sampling plan has graded as acceptable. The remaining 30 per cent containing the defective sheets is counted, inspected or sorted in the normal manner.

When we first introduced the Quality Acceptance Sampling Plan we anticipated a reduction in our inspection — sorting — material handling force of 15 to 31 per cent, which amounted to over $100,000 per year minimum and exceeded $200,000 per year maximum. The actual savings realized are already over the minimum and well on our way to the maximum. Final total will depend to a large degree on the average quality level of paper (fraction defective) delivered to the Finishing Room and the success of automatic counting.

Conclusion

We have not yet realized the full economic or quality potential of our Quality Acceptance Sampling Plan. Refinements and adjustments will be made in the program as we gain more experience with it. But even beyond this we consider sampling as an interim screening method.

Our ultimate objective is to electronically reject defective paper at the cutters and send the acceptable paper straight to the trimmers (unless at some point we decide that the trimming operation is unnecessary). This, of course, is some years away. In the meantime, the Quality Acceptance Plan will continue to improve our quality level and reduce our costs.

Acceptance Sampling in Finishing Fine Papers

Gordon C. Campbell,
Manager, Technical Dept.,
The E. B. Eddy Co.,
Hull, Que., and

Edward Forst,
Stevenson, Jordan & Harrison, Inc.,
Management Engineers,
New York City

The acceptance sampling procedures at the E. B. Eddy Co. illustrate a feasible solution to the problem of assuring that the product being shipped meets the specifications.

To arrive at the solution we studied the many possible proposals for controlling the quality of the outgoing product.

Each was considered and its limitations for our operations was defined. Its advantages and disadvantages with respect to quality assurance, cost, reliability, feasibility, and ease of supervisory and managerial control were determined. The cost of installing and operating the system as well as the cost of its failure was assessed. In the case of mechanical and electronic devices, the kind and cost of stand-by procedures and methods were considered. All these factors were judged against the program, plans, and ability of the manufacturing units to produce to specification.

Whether the final solution is the best we will never know. What we do know is that an adequate, economical answer was achieved. As changes occur in our operating conditions, in our customer demands, and among our competitors, we will alter our control methods and sampling procedures.

For our company the answer to our problem of controlling quality appeared to lie in the use of statistical methods in our finishing room operations. Our management decided to test acceptance sampling.

Acceptance Sampling

Acceptance sampling meant that we would use formal sampling plans with calculated sampling risks and designated quality levels to control the quality of the paper at the sheet cutters and the trimmers. We planned and developed sampling techniques which provided a decision and information on each lot sheeted at the cutter. Lots leaving the cutter were designated as acceptable or unacceptable for shipment. The unacceptable lots were identified with red Reject Tags bearing the names of the defects causing the rejection. In addition samples of the defects were placed on the lots. Estimates of the percentage of defective material in the lot were provided.

We not only planned to stop lots of poor quality from reaching the customer but we planned to generate the data that would permit intelligent decisions to be made about the disposition of rejected lots.

We further planned to utilize the inspection data as it was generated to prevent the continued sheeting of defective rolls. We planned to bring about corrective action at the cutter so that sheet sorting of reject loads would be reduced to a minimum and if possible, eliminated. The program was to emphasize two aspects of our operations; ship good quality and take corrective action when the quality is unacceptable.

Sampling Procedures

The immediate problem in establishing the acceptance sampling functions at the cutter was manpower. We wanted the acceptance sampling work force to be at an irreducible minimum. We use one inspector to control two sheet cutters.

With a work force this small, efficient sampling procedures were needed. We desired good control, adequate discrimination in quality, and maximum useful inspection from the inspector. Single sampling plans were considered and rejected. These plans made life pleasant for the supervisors at the expense of the inspectors. Administration and data processing of the information from the single sampling plans was simple but the required sample sizes were too large and the discrimination in the plans was not adequate. Much of the inspectors' time was wasted examining good and bad lots.

Double sampling plans offered some improvement in the utilization of the inspector's time but presented us with some awkward mechanical problems in sampling. What we were seeking was a procedure which would prevent the inspector from inspecting too much paper when the lots were very good or poor, and force him to inspect more paper when the lots were marginal in quality. Such conditions are to be found in the use of sequential sampling plans. We gained better sampling decisions when necessary and this is where our money lay.

Inspector—The Key

In efficient inspection operations an inspector enforces standards. In less efficient inspection operations he becomes a demigod capable of daily determining the customer's needs and the company's profits in the light of the incoming quality of the product. This attitude had to go if our

sequential sampling plans were to have any meaning. Our inspector was going to be a policeman, not a judge and seer.

To bring about this happy state we re-wrote standards so that the inspectors were permitted to say only "yes" or "no" to the comparisons they made.

The key to the entire system is the sampling inspector. He must be carefully selected, trained, and supervised. His tools are his ability, his vision, his understanding of his job, the sampling plan tables, the Inspector's Manual, the Defect Manual, The Product Specification Manual, an efficient inspection station, and management support.

As much care should be spent on selecting the inspectors as is spent on considering capital expenditures. A poor inspector can reduce profits more quickly than a competent engineer can increase them.

Procedure Used

In our system the inspector works at an inspection station located at the cutters. He controls two cutters. He has an established procedure. Briefly, he follows the following work procedure. Upon arriving at his station he checks his tools and equipment. His clip board, Veeder-Root counters for keeping track of the defects in his sample, Defect Manual, Inspectors Manual, Product Specification Manual, data forms, lights, etc., must all be functioning and available.

He performs a first piece inspection at the backstands. The date and sets of the rolls are verified. The finish, side and color are examined. All details essential to a correct run are determined. Sheeting cannot begin without his approval. Immediately after sheet cutting begins, the inspector verifies the original first piece inspection. As soon as the cutter operator signals that this setup is correct the inspector tests size and square. The run cannot be released into production without approval of the inspector.

As sheet cutting progresses, the inspector obtains samples at random, inspects the sheets, tallies the results of his inspection and compares his results with his sequential plans. Based upon the comparison of his results with the plan he can arrive at a decision at any time during his inspection. Defect information is communicated to the cutter operator for corrective action whenever justified.

Depending upon the results obtained from the sample the lot is designated as acceptable for trimming or rejection. The reject lot bears descriptions of the defects, samples of the defects, and a percentage estimate of the amount of defective material. The reject lot passes into a hold area for review and decision by supervision.

Outgoing Quality Inspection

A team of roving inspectors examines the quality of the trimmed reams for trimmer characteristics and a verification of visual defects. These inspectors provide us with a final check and measure of the outgoing quality of our products. They, too, operate with sampling plans.

How It has Worked

The results have been good. Complaints have been reduced, customer satisfaction has improved and an appreciable reduction in inspection costs has been achieved. Management is establishing the practice of setting quality objectives.

We believe that this sampling inspection system supported by management and with the cooperation of the production personnel, offers Finishing Room Supervision the means to control quality effectively, reduce costs, and increase profits. We believe too, that its continued success depends upon the careful and continued training of the people operating the system, the careful and continued indoctrination of the production supervision and managers involved, and the understanding and support of the Sales Division.

We believe that the system contains many advantages. It is flexible, easy to adjust, low in cost to operate, and effective in its control of quality.

PJT NEW LITERATURE

Engineering and Application Data

Covers a versatile line of overhead tramrail or monorail type of materials handling equipment. Emphasis is given to Cleveland Tramrail's revolutionary new Tarca Track, recently introduced. 12 pp. Booklet No. 2008-R. Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

Belt Gravimetric Feeder

Describes Model 37-04, a feeder ideally suited for the precise feeding, by weight, of almost any dry, flowable material, such as foods, feed, flour, plastics, chemicals, minerals and ores. Illustrations, dimensions and specifications and a thorough description are included. Data Ref. No. 37-04.201-1 B-I-F Industries, P. O. Box 276, Providence 1, R. I.

Control Valve Comparison Booklet

Compares the various features of control valve construction and operation. Discusses problems facing valve users and suggests ways that can be overcome. Covered are such subjects as shutoff, maintenance, differences in body construction and price comparisons between the two primary types of design. 8 pp Booklet. Conoflow Corp., 2100 Arch St., Philadelphia, Pa.

Industrial Process Instruments

Contains information on Honeywell instruments and systems for measuring, recording and controlling industrial processes. Includes specifications, price range and literature reference. G. A. Reed, Product Editor, Minneapolis-Honeywell Regulator Co., Wayne and Windrim Ave., Philadelphia 44, Pa.

How S. D. Warren Uses Mt. Hope Rolls

Explains and illustrates how S. D. Warren 450 t.p.d. mill at Westbrook, Me., uses the rolls on calendar stacks, on precoaters and second coaters, on the winders and on the machine reels. 4 pp. Brochure SDW-61. Mt. Hope Machinery Co., 15 Fifth St., Taunton, Mass.

14th Bolton Award Book

Contains the ten winning essays and a composite of all papers entered in this year's 14th Bolton Award. The book is being distributed throughout the pulp and paper industry by John W. Bolton & Sons, Inc., co-sponsor with the Paper Industry Management Ass'n., Chicago, Ill. of the annual Bolton Award essay contest.

Open to all persons engaged in the pulp, paper or paper converting industry of the United States and Canada, the subject of the annual essay competition this year was "Privileges of the Free Enterprise System." Announcement of the subject for the 15th Bolton Award will be made on January 2.

Copies of the Bolton Award book are available without charge to interested members of all industries, schools, colleges, libraries and government agencies. Arthur G. Schwarzenberg, John W. Bolton & Sons, Inc., Lawrence, Mass.

Use of Titanium Dioxide as a Filler and in Coatings for Paperboard

A discussion of basic properties of titanium dioxide and its major applications to paperboard as a filler and as a constituent of the calender treatment and in coatings.

William R. Willets and Francis R. Marchetti,
Technical Service Laboratories,
Titanium Pigment Corp.,
New York, N. Y.

The use of titanium dioxide in the paper and paperboard industry continues to expand at an ever-increasing rate, in spite of its relatively high cost compared with other white fillers and pigments. There is a logical reason for this. Titanium dioxide is unique in that it produces optical effects unattainable with the cheaper fillers. In addition to its unique optical properties, titanium dioxide is readily dispersed and offers no problems in handling. It can be added dry to the pulper or beater, or slurried in a central slurry system and fed to any desired point in the process. It is readily incorporated in coating colors and can be handled on all the varied types of equipment used for preparing and applying them.

Titanium dioxide as a pigment exists in two crystalline forms—anatase and rutile. Anatase has a refractive index of 2.55 and rutile of 2.7. Rutile therefore has greater opacifying power than anatase, which is especially evident if the sheet is waxed, oiled, or varnished. It also costs more than anatase. The question of whether to use anatase or rutile will depend on the specific case in point; both are being widely used. In addition to pure titanium dioxide, composite pigments of coalesced rutile and calcium sulphate anhydrite are used, one containing 30 per cent titanium dioxide and the other 50 per cent. These are naturally cheaper in cost than the pure titanium dioxide with the 30 per cent being cheaper than the 50 per cent.

Paper presented before the Annual Fall Meeting of The Pennsylvania-New Jersey-Delaware Division of Paper Industry Management Ass'n., October 12-14, 1961.

Opacifying Power

Particular mention should be made of the opacifying power of titanium dioxide. It might be assumed that "opacity" does not play a role in paperboard because most sheets are so heavy as to be essentially opaque, but this is not the case. Even though the overall opacity of the sheet (except where waxing is involved) may not be important in the case of paperboards, the opacity—hiding power—of the liner in the case of lined boards, of the calender size in the case of calender sized boards, and of the coating in the case of coated boards determines the ultimate brightness of the final product.

The hiding power will in turn be governed by the composition of the liner, calender treatment or coating, as the case may be. Some typical examples are considered below, where anatase titanium dioxide is one of the governing factors in increasing the hiding power. It should be emphasized, however, that titanium dioxide increases both hiding power and brightness, and thus has a dual beneficial effect on appearance.

Pigmenting The Top Liner

The earliest use of titanium dioxide for paperboard was to increase the overall hiding power and brightness of the top liner. It is in this application that some mills have found the composite rutile—calcium sulphate pigments offer economies. The pigment is added dry or as a slurry to the pulper or beater, and can also be metered in as a slurry to the fan pump or elsewhere in the system. Such addition to the topliner masks the off-color of the board middle and increases the overall brightness of the final sheet. There is also much less tendency to stain when in contact with greasy or oily substances because titanium dioxide retains its hiding power and whiteness even under such conditions.

The extent to which brightness is increased by increments of titanium dioxide depends on the initial brightness without pigment. Typical curves

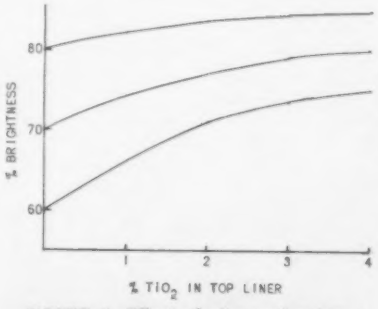


FIGURE 1—Effect of pigmenting top liner on lined board brightness.

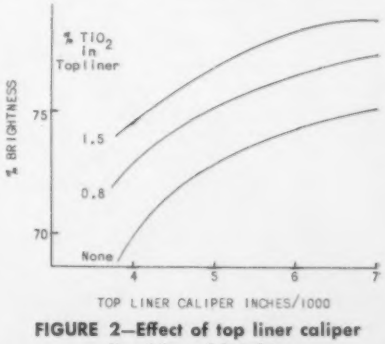


FIGURE 2—Effect of top liner caliper on lined board brightness.

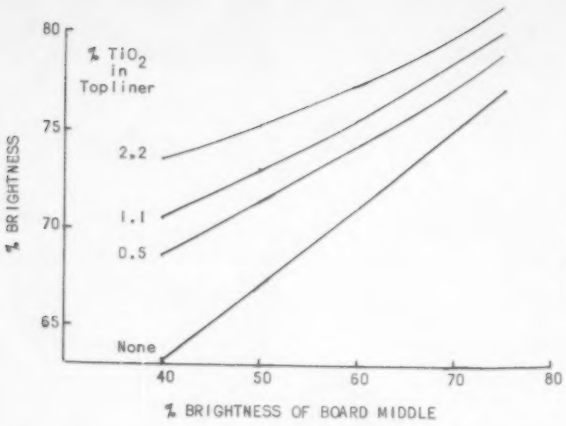


FIGURE 3 — Effect of middle brightness on lined board brightness.

are shown in Figure 1. If the brightness of a paperboard made with an unpigmented liner was 60 per cent, a four per cent titanium dioxide content increased it to 75 per cent; if the brightness with unpigmented liner was 70 per cent, a four per cent titanium dioxide content increased it to 80 per cent; if the brightness with the unpigmented liner was 80 per cent, a four per cent titanium dioxide content increased it to 85 per cent.

As noted the final brightness of a lined board is governed by the hiding power (opacity) of the liner. This can be varied by increasing the caliper (in which case the ultimate brightness of the liner itself would not be altered) or by pigmenting the liner which would increase both its hiding power and brightness. Figure 2 shows the effect of varying the top liner caliper using both unpigmented and pigmented liners. These illustrations show that the same lined board brightness can be attained with much lower topliner caliper if the liner is pigmented. For example, the same brightness was attained with only four points of a liner containing 1.5 per cent titanium dioxide as with six points of an unpigmented liner. Since liner furnish is usually the most expensive portion of the sheet, possible savings are indicated. Of course it is recognized that there must always be sufficient liner to give adequate bending properties and the like.

The underlying plies also have a marked effect on the brightness of the final board. Naturally it takes more liner hiding power to mask a very dull middle than a brighter one. This is illustrated by the curves of Figure 3. In all cases the liners were the same thickness, about 4.5 points, so the curves are directly comparable. It is obvious that a pigmented liner masked underlying plies much more effectively. As an example, a liner containing 2.2 per cent titanium dioxide gave the same final board brightness when applied to a middle of only 40 per cent brightness as did an unpigmented liner applied to a middle of almost 70 per cent brightness. As far as brightness is concerned the appearance of the final board can be achieved by applying a pigmented top liner to a chip middle just as well as applying an unpigmented top liner on top of a much higher brightness subliner.

The above illustrations serve only to indicate the many variations made possible by pigmenting a top liner. The caliper may be decreased, the liner applied to a duller middle, and final brightness greatly improved. All sorts of variations and combinations are possible because pigmenting the liner in any event increases its basic hiding power and brightness depending on the degree of pigmentation.

Boards for Waxing

It was noted earlier that pigmenting waxing boards increased both overall opacity and brightness and this is illustrated by the curves of Figure 4. Here overall opacity as well as brightness is important to insure an attractive appearance. The effect of waxing on opacity and brightness will vary greatly; they will be decreased much more if the sheet is thoroughly impregnated than if dipped and quickly chilled. The effect of varying the type of waxing, however, becomes less as the amount of titanium dioxide in the board increases. Rutile is usually the favored pigment for waxing grades.

Up to this point the addition of pigment to the furnish itself has been considered. It should also be noted that titanium dioxide is frequently being applied in conjunction with starches, gums, alginates and various other sizing materials at the calender water boxes. Naturally details for such application must be worked out for the specific case in question, depending on the size solution used, type of board, calenders, etc. If the stacks are not in good shape, are scored or nicked, the use of titanium dioxide will emphasize any imperfections in the sheet.

Generally the titanium dioxide is

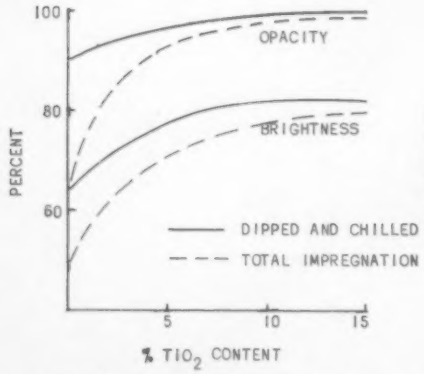


FIGURE 4—Effect of pigmenting 10 point waxed bleached kraft board.

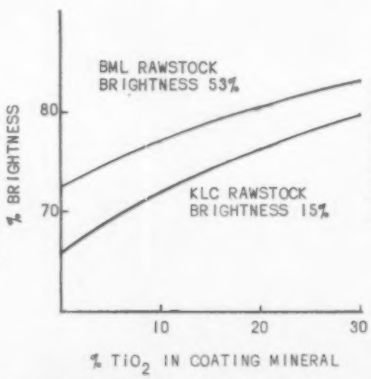


FIGURE 5—Effect of pigmenting coatings 4 pounds/1000 sq. ft. on different base stocks.

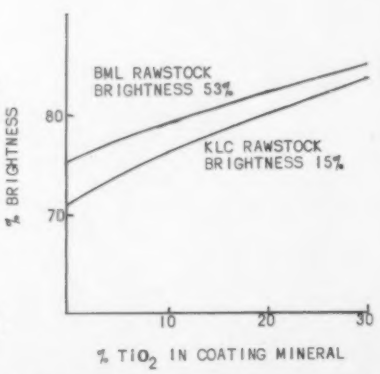


FIGURE 6—Effect of pigmenting coatings 6 pounds/1000 sq. ft. on different base stocks.

dispersed by high speed mixing or milling in water using a glassy polyphosphate. The well-dispersed pigment is then added to the prepared calender size and thoroughly mixed. Usually the amount of pigment solids is approximately that of size solids. In this case rutile is frequently favored over anatase because the higher hiding power of the rutile may be an advantage when only small quantities can be applied. The actual weight of pigment put on at a water box is usually only about 0.1 to 0.15 pounds per thousand square feet and from two water boxes about 0.25 pounds per thousand square feet, certainly not a true "coating." Even such small amounts as about 0.15 pounds per thousand square feet raised the brightness of a vat-lined board from 62 to 64 per cent in one case and 69 to 72 per cent in another. When applied to an unbleached kraft liner at the rate of about 0.15 pounds per thousand square feet, the brightness was increased from 15 to 19 per cent; when applied to a jute liner, brightness increased from 31 to 36 per cent.

Use in Calender Treatment

Calender application cannot be expected to produce large increases in brightness such as result from pigmenting top liners or coatings but the improvement is readily evident. If the board is being calender treated to improve gloss ink holdout, finish, etc. the addition of the pigment does not materially affect cost but does improve brightness and frequently also surface smoothness and printability.

The coating of paperboard has become such common practice in recent years that uncoated folding boxboard (or any board to be printed) is today more the exception than the rule. It has been clearly demonstrated that the pigments in the coating have a great effect on printability, varnishing characteristics, etc. Titanium dioxide is in the same category as the fine particle premium clays in this regard and as already noted can be readily incorporated into the coating color by any of the methods used for coating make-down.

Coating of Paperboard

Pigmenting a coating color increases the brightness of a coated board, just as pigmentation of the top liner increases the final brightness of a lined board. The amount of titanium dioxide needed to give a desired effect will be controlled in part at least by the brightness of the raw stock and the weight of coating applied. This is illustrated in the curves of Figure 5 and Figure 6 which represent coatings applied at four and six pounds per thousand square feet, respectively, to raw stock of 15 per cent and 53 per cent brightness. With the four pound coating, the color containing about 15 per cent titanium dioxide gave the same brightness when applied to the low brightness raw stock as did the unpigmented color applied to the higher brightness raw stock; when six pounds of coating were applied, only about 10 per cent titanium dioxide sufficed to give the same brightness to the dull raw stock as the unpigmented color applied to the higher brightness raw stock. The brightness range was naturally higher at the heavier coating but about 10 per cent titanium dioxide made it possible to get the same brightness with the four pound coating as with the unpigmented six pound.

Just as was the case with lined boards, all sorts of variations and combinations are possible depending on the brightness of the raw stock, the weight of coating applied and the hiding power and brightness of the coating without titanium dioxide. The important point is that titanium dioxide makes it possible to attain better brightness than other materials because it improves not only the hiding power but also the brightness of the coating. There are very definite analogies between the pigmenting of a top liner and the pigmenting of a coating color. Titanium dioxide reduces staining when the board comes in contact with oils or greases because the pigment retains its hiding power and whiteness. When used in colored or tinted top liners or coating colors, titanium dioxide gives added brilliance and avoids a dull, muddy appearance. In all cases titanium dioxide tends to improve printability.

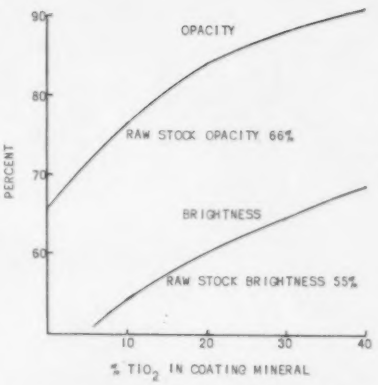


FIGURE 7—Effect of pigment on opacity and brightness bleached kraft liner coated at 5 pounds per 1000 sq. feet after complete impregnation with wax.

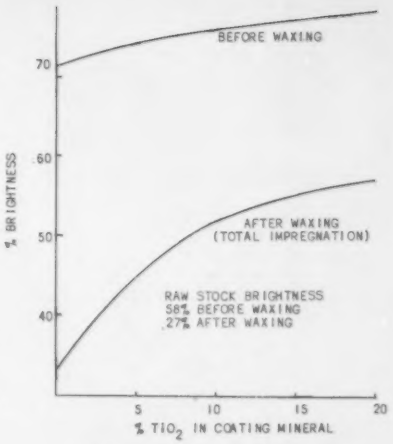


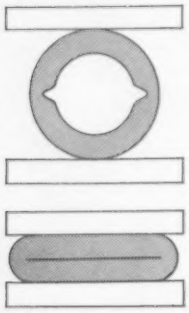
FIGURE 8—Effect of pigment on brightness semi-bleached kraft liner coated at 2.5 pounds per 1000 sq. ft.

Similarly there are analogies between the pigmentation of a coating applied to a waxing board and an uncoated waxing board. If coating is applied at the rate of five pounds per thousand square feet to a bleached kraft board that is subsequently completely wax-impregnated, the opacity and brightness of the board increase greatly with increasing pigmentation. This is shown in Figure 7. After waxing, the brightness of the board coated with an unpigmented color (no titanium dioxide) was actually lower than that of the uncoated base stock, while the opacity was fairly similar. The effect of applying coatings to a semi-bleached kraft on brightness both before and after waxing is shown in Figure 8. The addition of titanium dioxide to the color improved brightness in both cases, but the effect was far greater after the sheet was waxed.

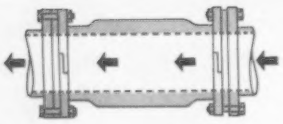
Another possibility analogous to all the points noted above and one which should not be overlooked involves the extrusion of polyethylene and other hot melts to produce superior barriers to moisture vapor and other gases, liquids, greases, etc., and to impart scuff resistance. The use of small amounts of titanium dioxide in such resins (and also in solvent polyvinyl and similar types) does not apparently affect the barrier properties, but does give superior brightness and overall appearance.

Massco-Grigsby PINCH VALVES

"Hinged" sleeve permits tight closing reduces wear.



Recesses in sleeve serve as "hinges" during compression.



Unobstructed flow eliminates high friction loss; and there are no metal parts in contact with pulp or liquid.

Several types of closing mechanisms are available, from handwheel to motorized.

Automated Systems. Completely automatic systems may be coordinated and interlocked with other plant equipment.

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Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'an.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED NOVEMBER 7

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	$8.00/7.75	n.a.	n.a.	$8.25/8.00
3	7.75/7.25	$8.25/7.25	$7.50/7.00	7.50/7.00
4	7.25/6.75	7.00/6.75	6.75/6.50	6.75/6.50
5	6.75/6.25	6.50/6.25	6.50/6.00	6.00/5.75
6	6.25/5.85	6.00/ —	5.75/5.50	5.50/5.25
7	5.85/5.50	6.00/ —	4.75/4.00	n.a.

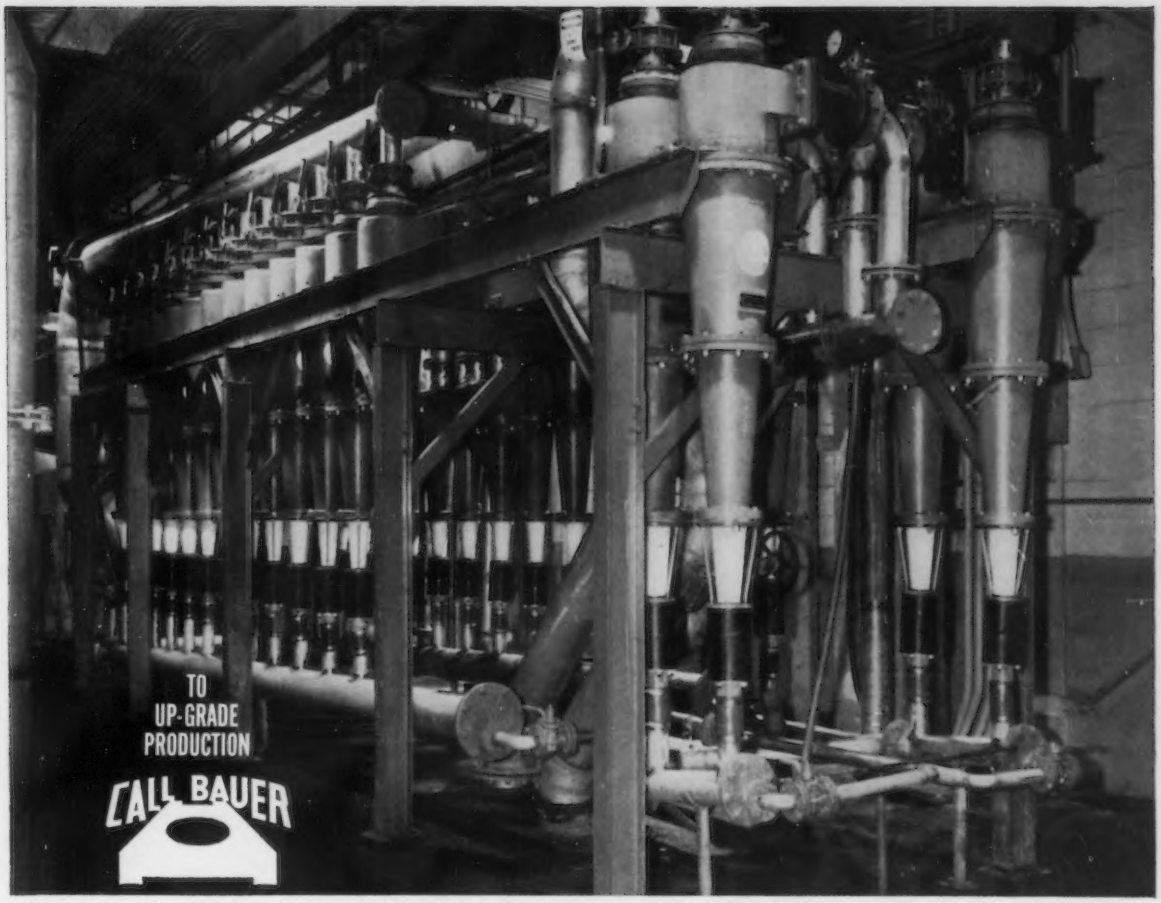
WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	November 13	November 13	November	November
No. 1 Mixed Paper	$ 12.00/ 13.00	7.00/ 10.00	6.00/ —	12.00/ —
No. 1 News	16.00/ 18.00	11.00/ 14.00	16.00/ —	15.00/ —
Overissue News (Lg. size)	21.00/ 24.00	12.00/ 14.00	21.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	10.00/ 12.00	11.00/ —	13.00/ —
Old Corrugated Containers	22.00/ 25.00	18.00/ 18.50	20.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	30.00/ 32.50	30.00/ 32.50	32.50/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	40.00/ 45.00	42.50/ —	— / —
New 100% Kraft Corr. Cuts	42.50/ 47.50	— / —	50.00/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 75.00	45.00/ —	37.50/ 40.00
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	45.00/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	45.00/ 47.50
No. 1 Groundwood Shvs.	30.00/ 35.00	20.00/ 25.00	15.00/ —	25.00/ —
White Newsblanks	50.00/ 55.00	40.00/ 45.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	55.00/ 65.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	95.00/100.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	50.00/ 55.00	54.50/ 59.50	47.50/ —	35.00/ —
Manila Tab. Cards	72.50/ 75.00	67.50/ 72.50	70.00/ —	75.00/ —
No. 1 Col. Ledger	35.00/ 40.00	32.50/ 35.00	40.00/ —	23.00/ —
White Ledger	55.00/ 57.50	50.00/ 55.00	50.00/ —	40.00/ 45.00
Mixed Book & Mag.†	14.00/ 15.00	— / —	8.00/ —	/ —
No 1 Books‡	15.00/ 20.00	18.00/ 22.00	22.50/ —	8.00/ 13.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.



Battery of Bauer No. 623 Centri-Cleaners on No. 4 machine at St. Croix Paper Company. Note long lasting ceramic lower cone nozzles and vacuum rejects-separator system which reduces wear on cleaners in the second and third stages of this modern installation.

Bauer Centri-Cleaners Improve Quality, Reduce Downtime at St. Croix

St. Croix Paper Company, Woodland, Maine, produces 500 tons of newsprint per day from pulp cleaned 100% with Bauer Centri-Cleaners.

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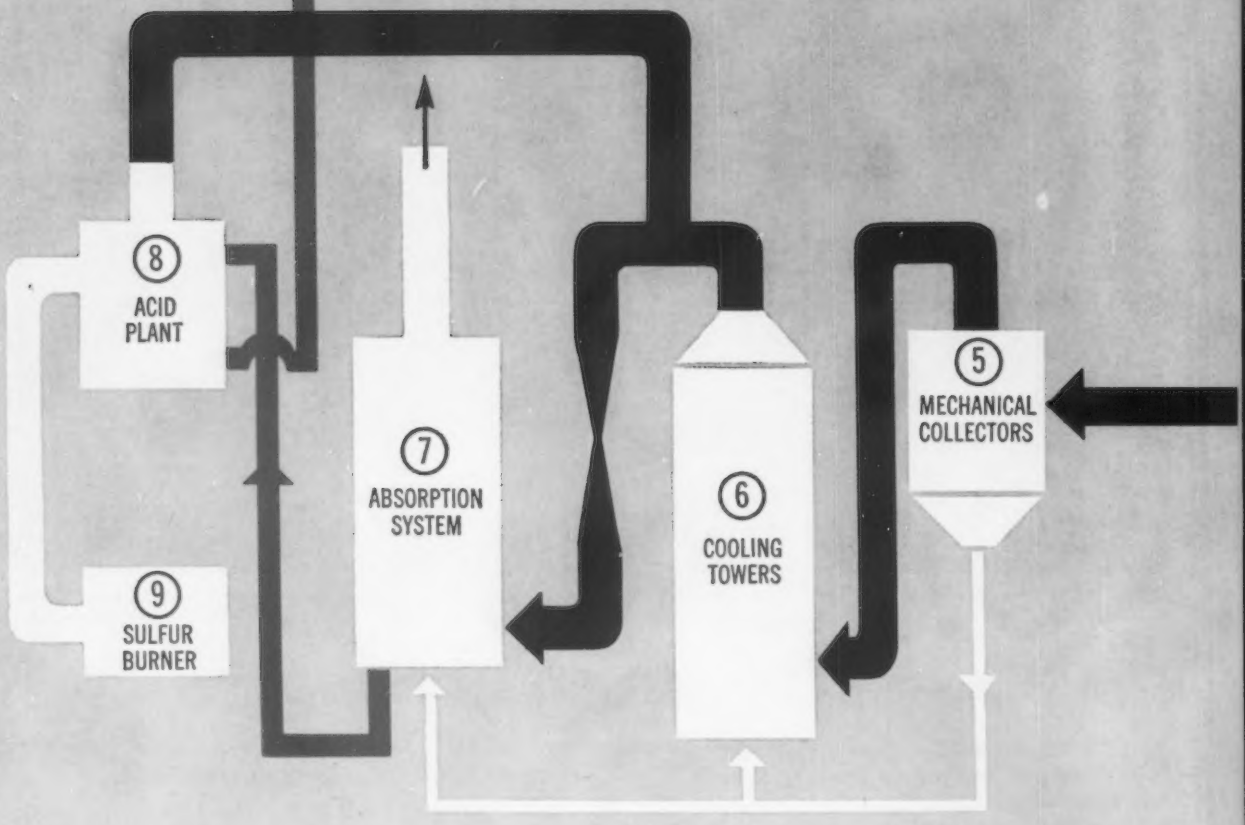
Brantford, Ontario

MgO pulping and recovery process. Pulp wood chips are digested in magnesium bisulfite liquor (1) pulp is withdrawn and washed (2) and knots removed. Liquor with 10 to 15% solids is passed through multiple-effect evaporators (3) to raise the solids content to 55% before burning in recovery boilers (4) to produce steam at 860 psi and 825 F for power generation and processing. MgO and SO_2 are released from the liquor during the incineration process. MgO is recovered in mechanical collectors (5) while the SO_2 and flue gases pass to the cooling and absorption towers (6). Recovered MgO is hydrated and introduced into the acid circulating to the absorption system (7). Here it combines with SO_2 to form magnesium bisulfite acid. The cycle is completed by fortifying the recovered magnesium bisulfite acid (8) with sulfur dioxide from the sulfur burner (9).

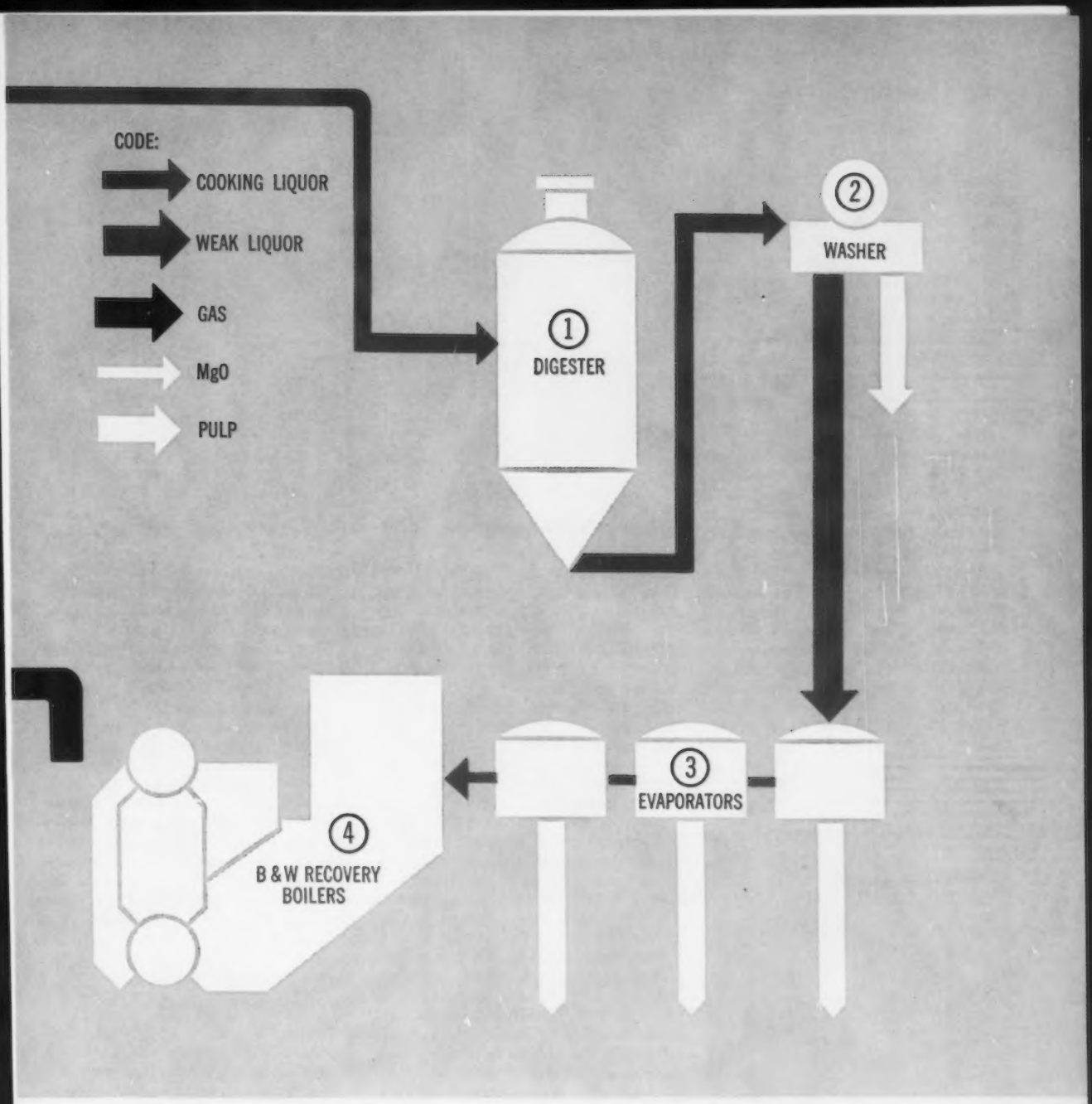


MgO process at Weyerhaeuser's Cosmopolis

Evaporators in series increase pulping liquor from less than 15% to about 55% solids to permit its burning.

B&W MgO recovery boilers burn the concentrated liquor, supplying 70% of the plant's steam requirements.

Mechanical collector reclaims MgO from furnace flue gas and washes it before further use.



Mill recovers 90% of spent liquor solids

Only 20 pounds of magnesium oxide and 40 pounds of sulfur per ton of unbleached pulp are needed for make-up at Weyerhaeuser Company's 400 ton per day sulfite mill at Cosmopolis, Washington.

The simple, closed cycle MgO pulping and recovery process, placed in operation during 1957, reclaims about 90% of the pulping chemicals. The B&W MgO recovery boilers provide 70% of the steam required for the entire plant's power generation and processing needs. A third B&W bark and oil fired boiler provides the balance of steam requirements.

The commercially-proven MgO pulping and recovery process is ideal for either new mills or conversion and modernization of existing mills. Shorter cooking time required for MgO pulping cuts capital and maintenance costs in new installations and permits increasing the production of existing mills. Quality sulfite pulp with high brightness and strength is produced.

For more information about the efficient MgO pulping and recovery process, contact your nearest B&W sales office or write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio. E-302-1001

Babcock & Wilcox

(Continued from page 30)

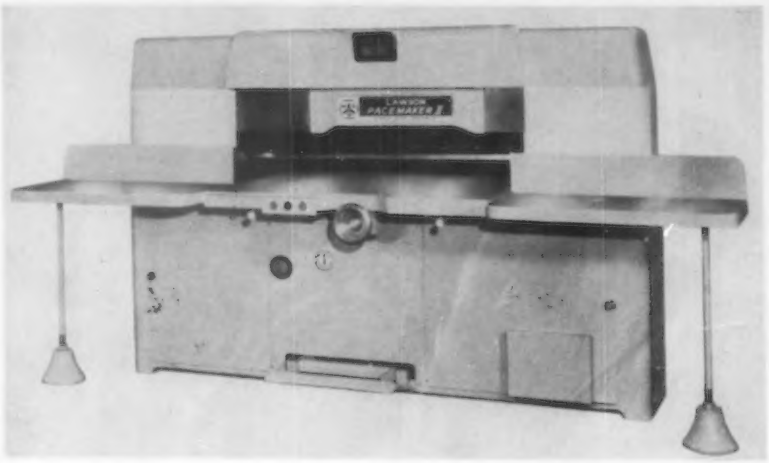
grated with a peristaltic-action addition pump and a set of timers. The pH instruments are standard Leeds & Northrup units, and may be regulated at any pre-selected level throughout the entire acid-base range with an accuracy of ±0.1 pH.

Autoclavable, plug-in electrode assemblies have specially insulated wire leads, and will withstand repeated steam sterilization at temperatures up to 250°F and pressures up to 100 p.s.i.

The electrodes are sterilized in place by means of electrode adapters which can be readily mounted in the side of the reaction vessel. These adapters are available in virtually any length for working volumes from 1 liter up to full production levels.

Two models of the controller are available. Model pH-161 controls either acid or base, while Model pH 162 provides dual control of both acid and base. Further information and engineering data sheets may be obtained by writing New Brunswick Scientific Co., Inc., 1130 Somerset Street, New Brunswick, N. J.

PORTABLE EXTRUDER for hot melt adhesives needs just one hour to heat up, can be stocked, disconnected, moved to new location, hooked up and ready for use again in just 15 minutes. Will handle all forms of hot melt adhesives. Claimed to be ideal where an adhesive is required to handle difficult surfaces at high speeds from 200 to 1,000 f.p.m. depending on the film to be bonded. Stein, Hall & Co., 285 Madison Ave., New York.



Trimmers Redesigned With Entirely Enclosed Parts

The Lawson Pacemaker II has been completely redesigned with the modern look, featuring clean lines and a completely enclosed design. are all located inside the massive base casting for extra protection and simpler maintenance.

A complete departure in paper cutter design is the use of dual drives for the knife bar pulls. Dual conical drives at both ends of the knife bar utilize multi-mesh gearing to eliminate "chatter" and knife vibration. They also are said to reduce knife bar linkage to the absolute minimum (2 points on each bar). In addition, "shear slot-line pull" is directly in line with the shear slot on the cutter. The pull bars are fastened to the knife bar right on the line of the cut.

Box-type clamps with full height clamp guides (gibs) are provided. The clamp cylinder is located inside the hydraulic tank, easily accessible from the front of the machine. Antifriction and sealed-in bearings which require no lubrication are used wherever possible. A cast-in run off tray catches any lubrication leakage or prevents possible hydraulic seepage.

The Pacemaker II models are available in 42, 47, 52, and 56 inch sizes. They have standard 6½ inch clamp openings with a knife speed of 50 strokes per minute. Extra large 78 inch back tables are available as optional equipment.

All controls have been located under the front table. The distance from the back gauge to the cut line is projected onto a large screen located at eye level on the front of the machine and is graduated in 64ths. Also, large size side tables are provided.

For safety, double pull bar overloads prevent damage in case of operator error. Double safety is provided on the clutch disengage mechanism and an electric clutch and brake assure positive stopping action.

The Lawson Electronic Spacer has been modified to provide an indexing feature. Electronic signals are easy to position and permit the spacing device to operate within .002 inch accuracy at all times. Because there are no physical contacts the accuracy of the spacing is not disturbed by dust, dirt or changes in atmospheric condition. The Lawson Autoset tape operated high speed spacer will be available as optional equipment at a later date. Additional information is available from The Lawson Co., 2011 Hastings St., Chicago 8, Ill.

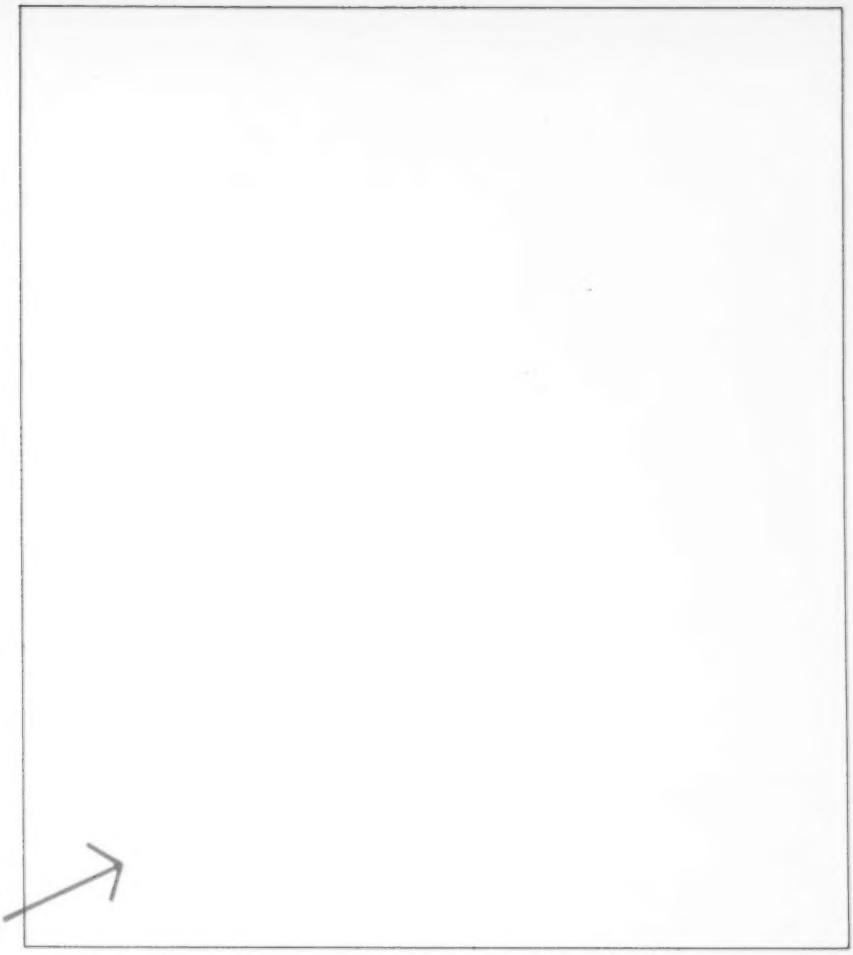
Valve Positioner Small Size Develops Strong Thrust

A small-size valve positioner, that develops 1,200 pounds of thrust, yet weighs only 30 pounds, has been announced by Hagan Chemical & Controls, Inc., Pittsburgh, Pa.

The pneumatic positioning unit, used to drive valves, dampers, levers or other final control elements, is only 16-3/16 inches high. It produces a 40 to 1 thrust to weight ratio. The positioning cylinder has a 4 inch bore and a 5 inch stroke.

With an accuracy of 1.0 per cent full stroke, the positioner is suitable for use in high reliability control systems. Full five inch stroking time is two seconds or less. Frequency response of the unit with no load at 10 per cent peak to peak input signal change is 1.0 c.p.s. At 5 per cent peak to peak, frequency response is 0.5 c.p.s.

(Continued on page 52)



SORRY, THIS IS THE BEST PICTURE WE COULD GET OF POLAR-6

You see, this brand new chemical treatment, (it's a Huyck exclusive, of course) makes papermaker's felts *colorless* . . . permanently! This remarkable new treatment resists color change caused by ultraviolet light, heat, chemicals and age. We named it . . . POLAR-6.

We created POLAR-6 for use where colored treatments can't be used. POLAR-6 provides the outstanding advantages of Huyck's established treatments *without* color.

Hundreds of field and laboratory tests have been conducted with POLAR-6, covering size stability, resistance to abrasion, plugging and bacterial damage. We'd be happy to send you some of the eye-opening results of these tests. Just drop us a line at Rensselaer or . . . Ask your Man from Huyck.

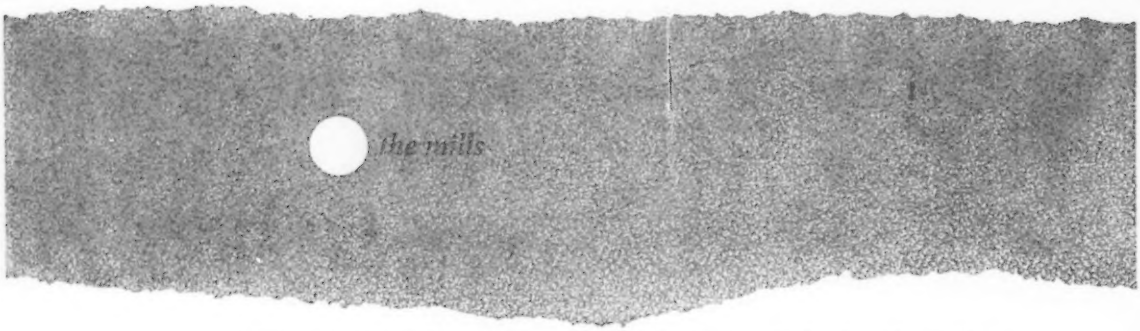
HUYCK FELTS

Huyck Felt Co., Rensselaer, N. Y.; Aliceville, Ala. • Division of Huyck Corporation • In Canada: Kenwood Mills Limited, Arnprior, Ontario

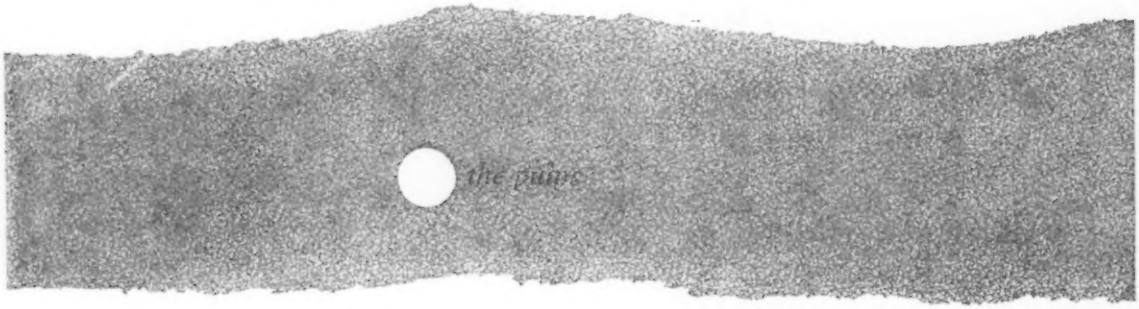
the mills

MONTMORENCY *the pulps*

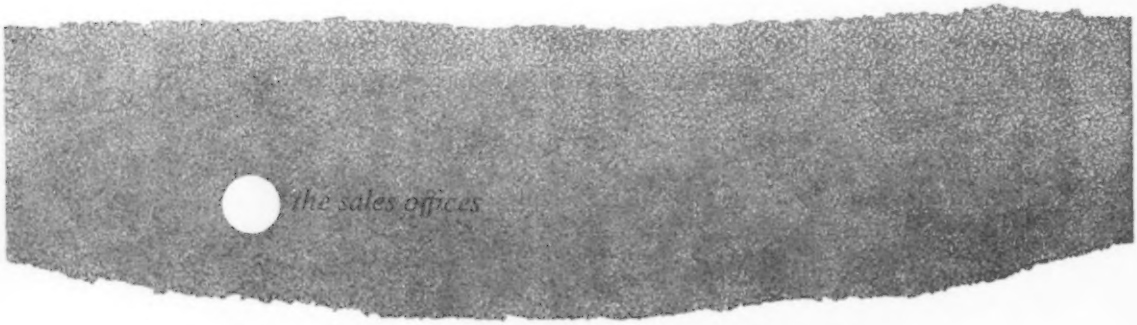
the sales offices



Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, P.Q., Canada, produces 80 tons of boxboard, 200 tons of pulp and 1,000 tons of newsprint *a day*.
Dryden Paper Company, Limited, Dryden, Ontario, produces 400 tons of pulp and 180 tons of bleached and unbleached kraft paper and board *a day*.



- Anglo-Canadian WONDERCHIP unbleached sulphite
- Dryden bleached kraft
- Dryden unbleached kraft
- Dryden specialty krafts (semi-bleached, condenser, photographic, anti-tarnish, etc.)



In New York City—Room 1254, 230 Park Avenue; phone MU 4-1100
In Chicago—20 North Wacker Drive; phone RA 6-3730

MONTMORENCY PAPER COMPANY, INC.

IN CANADA: ANGLO PAPER PRODUCTS, LIMITED

Papermaker's Rx for the Blues

NATIONAL®
Brilliant Bond Blue NMP

Another new development
from National Aniline paper dye research!

One more good reason why mills look to National Aniline for leadership in the technology of profitable colored papers!

This new direct blue was developed especially for paper . . . to meet your current production requirements. It's perfect for alkaline sizes and recommended for continuous coloring systems. Uniform, rapid striking power prevents problems in color development.

This rag content bond was colored with National Brilliant Bond Blue NMP, four pounds per ton shaded with one ounce of National Croceine Scarlet FP Conc.

Review all of the outstanding features of new National Brilliant Bond Blue NMP outlined on the reverse side of this page. Then write for samples!

Outstanding characteristics of

NATIONAL®

BRILLIANT BOND BLUE NMP

- Extreme brightness
- Excellent even-sidedness
- Fast, uniform striking power
- Minimum mottling or graniting
- Good cold-water solubility
- High light-fastness
- Works well with alkaline sizes
- Exceptional money-value
- Clear backwaters
- Not sensitive to pH variations

SAMPLES AVAILABLE

Sample of paper colored with
National Brilliant Bond Blue NMP
attached to reverse of this page.

Allied Chemical

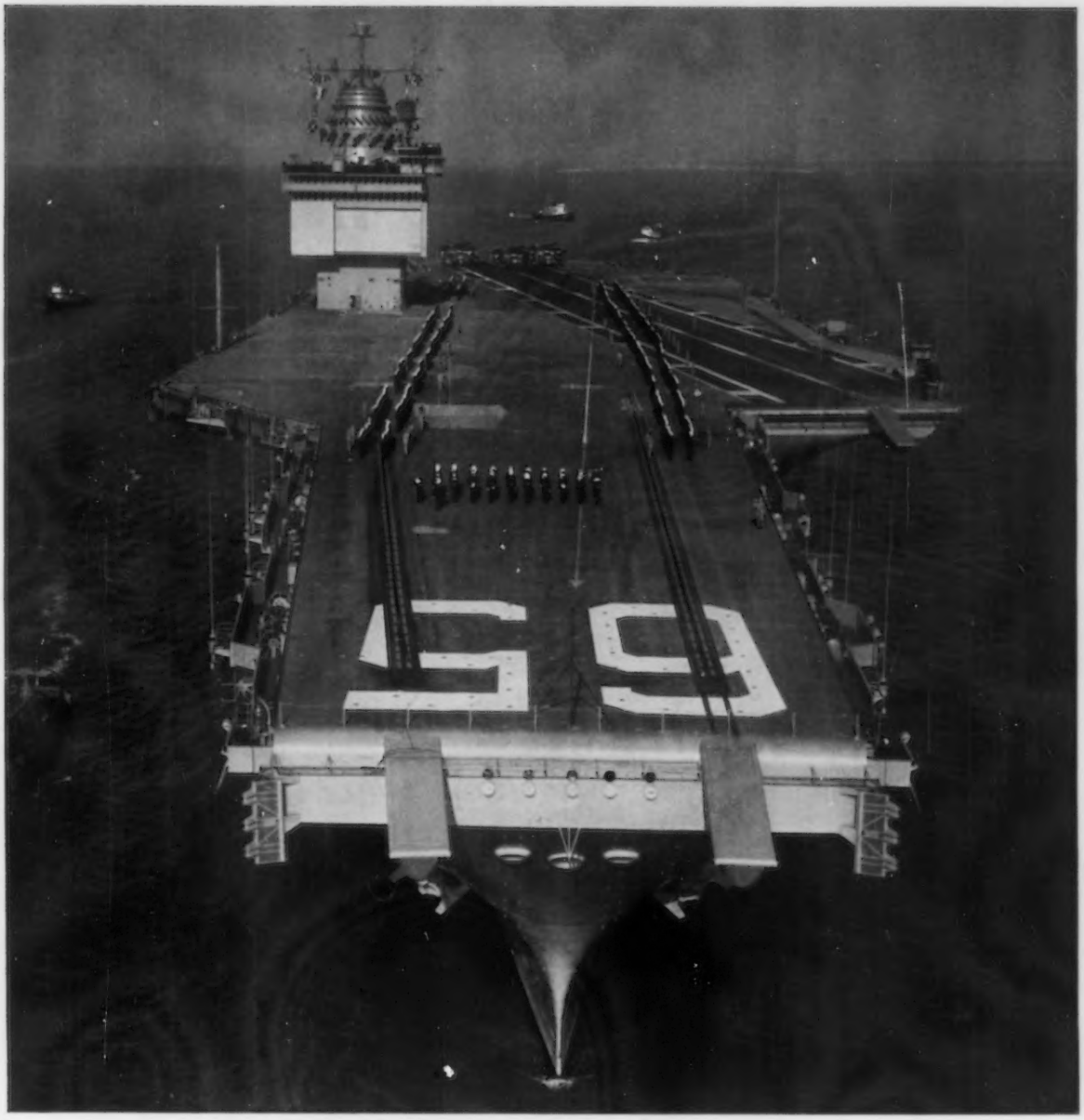
NATIONAL ANILINE DIVISION

40 Rector Street, New York 6, N. Y.

Atlanta Boston Charlotte Chicago Dallas Greensboro
Los Angeles Philadelphia Portland, Ore. Providence San Francisco

In Canada: ALLIED CHEMICAL CANADA, LTD.,
1450 City Councillors St., Montreal 2 100 North Queen St., Toronto 18

Distributors throughout the world. For information:
ALLIED CHEMICAL INTERNATIONAL • 40 Rector St., New York 6, N. Y.



ENTERPRISE . . . at NEWPORT NEWS
a word with a double meaning!

To most people, it means the world's first nuclear-powered aircraft carrier. To us at the Shipyard, it means the energy, imagination and resourcefulness that delivered the great *Enterprise* nine weeks ahead of schedule—in many months less time than was taken to build some non-nuclear ships of her type.

Because of her eight reactors and extensive electronic system, no shipbuilding job was ever more complex. For 1,366 days, many constantly-changing challenges were met and surmounted. How well the men, methods and machines of Newport News discharged their responsibility for building the world's largest ship is now a matter of public and official record.

This is *enterprise at Newport News* . . . leader in shipbuilding and in the manufacturing of water power and other heavy industrial equipment.

Newport News
SHIPBUILDING AND DRY DOCK CO. NEWPORT NEWS, VIRGINIA

(Continued from page 50)

Designed for indoor or outdoor operation, the positioner will operate at ambient temperatures as high as 170°F. With moisture-free power air, minimum operating temperature is 0°F. The unit requires no internal lubrication and is protected against contamination from water or dirt, whether it is mounted right-side-up or upside-down.

For additional information, write to Controls Division, Hagan Chemicals & Controls, Inc., Hagan Center, Pittsburgh 30, Pa.

Rotating Clamps Handle Tight-Wound Rolls

Three rotating paper roll clamp attachments for fork trucks, specially designed for handling the newer types of paper rolls now in use, have been introduced by Clark Equipment Co.'s Industrial Truck Division, Battle Creek, Mich.

Designated Models B-5, B-8 and B-10, the clamps are available with 180 or 270 degrees of rotation. Full hydraulic control of clamping action permits handling of various diameter rolls without need for manual adjustment of clamp arms.

The B-5 and B-8 clamps are detachable and have maximum capacities of 3500 and 5000 lbs. respectively. The B-5 clamp handles roll diameters from ten to 50 inches. The B-8 clamp handles rolls 12 to 60 inches in diameter. The B-10 clamp is an integral part of a special carriage upright and is non-detachable. It has a maximum capacity of 6500 pounds and handles rolls from ten to 60 inches in diameter.

The three clamps are available on rider-type gasoline and electric-powered fork trucks of 3000 through 10,000 lb. capacity.

Rotation of the clamps is accomplished with two hydraulic cylinders coupled with rack-and-pinion drive to give maximum rotating torque. The rotating bearing housing is totally enclosed for protection from dirt and foreign matter.

Clamp frames are of welded construction. For maximum strength, seamless steel tubing retains the clamp arm slides. Power pivoted arm is controlled at all arm positions by two heavy duty cams and cam followers. This eliminates clamp arm return springs. Clamp pads articulate and are faced with an abrasive rolled-steel plate to provide a sure gripping surface.

HOW MUCH LONGER DO THEY EXPECT US TO USE THIS "SHRINKER"?

FOR PROPER FIT... **ORR FELTS**

Proper fit means longer felt life... and a substantial reduction of felt costs. Orr's rigid engineering specifications guarantee correct weave and size... assure top performance regardless of grades being run.

Those are the basic reasons why Orr felts are preferred at so many mills.

ORR FELT & BLANKET CO.

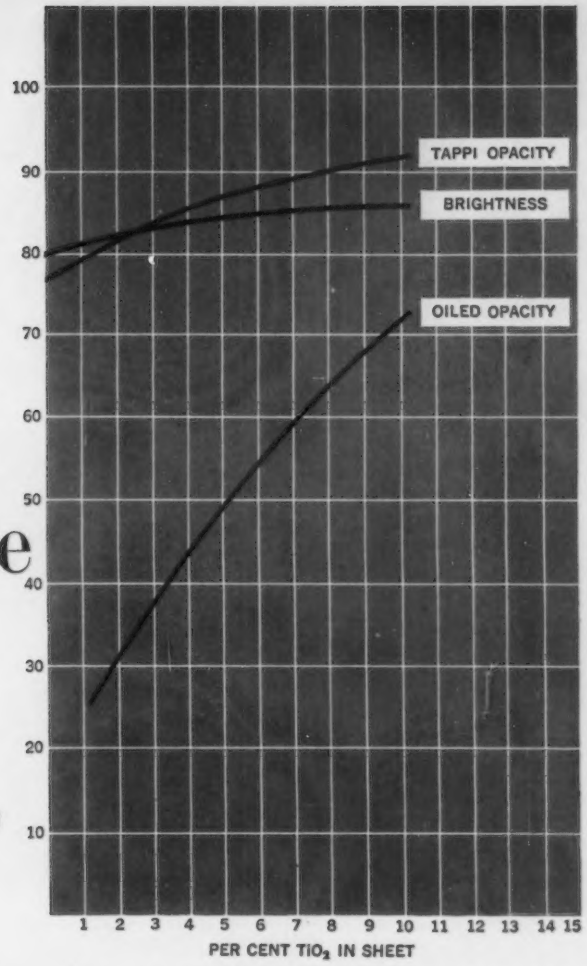
PIQUA, OHIO

Small Capacity Pump For Corrosive Jobs

For those highly corrosive pumping jobs involving relatively small capacities, up to 75 g.p.m., Goulds Pumps, Inc., now has available a 1 inch size Goulds-Pfaudler Glassed pump.

Model 3706, 1 inch x 1 inch-6 inches has glass, fused to metal, on all surfaces coming in contact with the pumpage, providing resistance to corrosion, eliminates contamination of product and adherence of product to pump parts. The bonded glass is tough and all glass surfaces are continuous with no bolt holes or tapped openings. A confined Teflon envelope gasket between casing and casing cover provides a corrosion-proof and leak-proof joint. With the quench

an outstanding titanium dioxide pigment made specifically for YOU



UNITANE® 0-120 This new pigment has been developed especially for the paper industry to give maximum retention. Designed specifically for wet-end additions, it has the same high brightness and opacity as the other well-known grades of UNITANE, and in tests with chlorinated starch has repeatedly given higher retention than any other titanium dioxide tested. These excellent properties are easily translated into savings for you—maximum opacity with minimum white water losses, high brightness with minimum show-through at lower basis weight, and good printed opacity. The curves illustrate the brightness, TAPPI opacity and oiled opacity obtained with UNITANE 0-120 at various concentrations of TiO_2 in the sheet.

A comprehensive report on the application of UNITANE 0-120 is available through your Cyanamid Pigments representative. Contact him today or write

CYANAMID

AMERICAN CYANAMID COMPANY • PIGMENTS DIVISION • 30 Rockefeller Plaza, New York 20, N. Y.
Branch Offices and Warehouses in Principal Cities

Lighter ∧ WHITER AND BRIGHTER WITH UNITANE

Outstanding characteristics of

NATIONAL®
BRILLIANT BOND BLUE NMP

- Extreme brightness
- Excellent even-sidedness
- Fast, uniform striking power
- Minimum mottling or graniting
- Good cold-water solubility
- High light-fastness
- Works well with alkaline sizes
- Exceptional money-value
- Clear backwaters
- Not sensitive to pH variations

SAMPLES AVAILABLE

Sample of paper colored with
National Brilliant Bond Blue NMP
attached to reverse of this page.

Allied Chemical

NATIONAL ANILINE DIVISION

40 Rector Street, New York 6, N. Y.

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In Canada: ALLIED CHEMICAL CANADA, LTD.,
1450 City Councillors St., Montreal 2 100 North Queen St., Toronto 18

Distributors throughout the world. For information:
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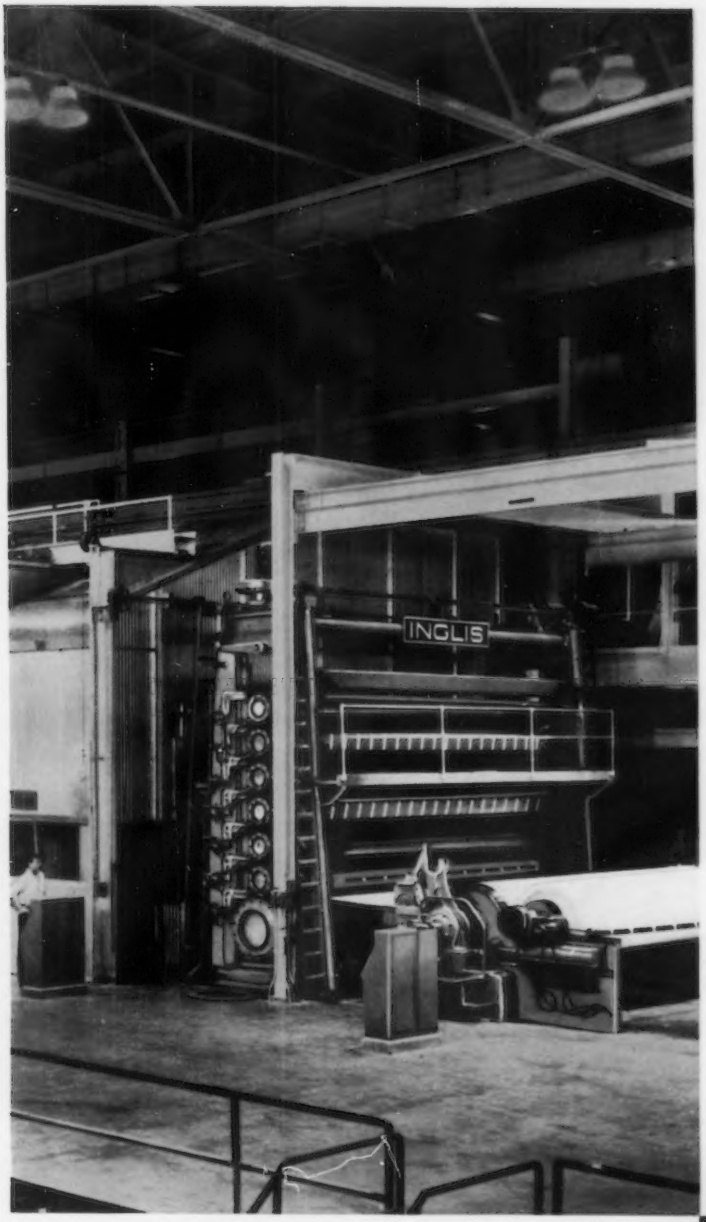
Still another expansion program puts Farrel rolls in the calender stack



Producing a good sheet depends to a considerable extent on the accuracy of the calender rolls. It is for this reason that so many progressive paper companies turn to Farrel when expanding their facilities. Fraser Paper, Ltd. is no exception.

A new paper machine was recently started up at this company's Madawaska, Maine, mill. Designed for a top speed of 2,000 FPM, it will add in excess of 40,000 tons of bond per year to the mill's capacity. Farrel rolls, of course, are at work in the single 8-roll calender stack. The king roll is 36 inches in diameter and the intermediates have a diameter of 18 inches.

Fraser Paper, Ltd. has also installed a Farrel two-wheel, swing-rest grinder for reconditioning the calender rolls. This grinder is generally considered to be the most accurate machine yet devised for grinding the long rolls used in the paper industry.

Whether you are replacing calender rolls or expanding your entire operation, you—as others have—will find it profitable to consult Farrel. Send for a copy of *new* 32-page bulletin 123.

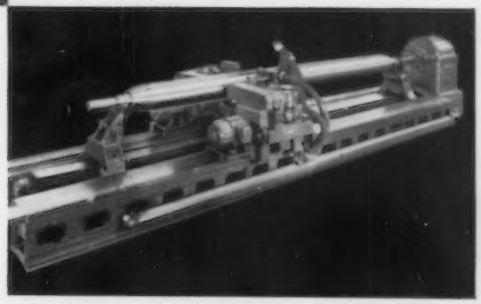
FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N.Y.

Sales Offices: Ansonia, Buffalo, Akron, Chicago, Los Angeles, Houston, Atlanta

European Office: Piazza della Republica 32, Milano, Italy

FARREL®



FB-1210

Which coating suits you best? There's

a DOW COATING to fit almost any paper need!

Among the many fine Dow products, you'll find paper and boxboard coatings for almost every application. Here is a partial list of the Dow products which serve the pulp and paper industry:

NEW DOW LATEX 630 . . . Coatings made from this styrene-butadiene latex offer demonstrably superior pick resistance, excellent mechanical stability and starch compatibility. Dow Latex 630 will produce a smoother, more uniform paper surface, providing maximum printability. Both type and half-tone reproductions will be sharp and clear, with a minimum of production problems.

DOW SARAN RESINS . . . For highly protective coatings offering reduced moisture vapor transmission and permeability to gases, and improved grease and oil resistance, select Dow saran resins. They can upgrade packaging films, paper and paperboard for use in many new applications.

SARAN LATEX F-122 . . . This aqueous solution of saran dries to form a continuous, tough, glossy film with high resistance to chemicals and water. Use it for decorative coatings and book bindings.

DOW POLYETHYLENE . . . A wide range of resins is available for extrusion coating and lamination of paper, paperboard and flexible packaging webs. They offer excellent gloss and heat sealing properties, as well as good water vapor, water and chemical resistance. Flexibility is maintained at low temperatures.

ETHOCEL® . . . This organo-soluble cellulose plastic is compatible with many waxes, resins and plasticizers. Coatings made of Ethocel are noted for heat stability and for solubility in low cost solvents.

To solve your coatings problems, call on Dow. You'll find not only a wide selection of products, but experienced technical assistance in their use. For information, write us in Midland, Coatings Sales Department 1932DP11-20.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

PTJ NEWS OF SUPPLIERS

Black-Clawson Co. has purchased William Kennedy & Sons, Ltd., Owen Sound, Ont., Canada, previously a division of Millspaugh, Ltd., Sheffield, England, for the purpose of manufacturing the line of Black-Clawson equipment for pulp and paper mills in Canada.

Modification of production facilities is under way at the Owen Sound plant of William Kennedy & Sons. Special machine tools and other equipment are being added to make the shops wholly adaptable for the production of the entire Black-Clawson line in Canada.

The users of Black-Clawson equipment in Canada have been served for many years by Black-Clawson (Canada), Ltd., Montreal. BCC will continue to provide engineering and technical sales services to the Canadian industry and will now deliver Black-Clawson machinery produced at the Owen Sound manufacturing plant as well as such machinery from the U.S. and British plants of Black-Clawson as delivery requirements may demand. It is the intention of the company, however, to bring the Owen Sound plant into production of the entire Black-Clawson line as rapidly as possible.

The Canadian plant is the eighth in Black-Clawson's world-wide manufacturing facilities, which include five plants in the United States, one in England and one in Brazil. The equipment produced in these plants includes Pandia continuous pulping equipment, a complete range of paper stock preparation machinery, paper and paperboard machines and air systems, equipment for paper and board coating and general converting, and extrusion equipment for the paper and plastics industries.

Manufacture of the established products of William Kennedy & Sons in the marine and specialty castings fields is being continued.

Infilco, Inc., subsidiary of General American Transportation Corp., with headquarters in Tucson, Ariz., announces consolidation of all Infilco municipal water and sewage treatment operations in the United States and Canada into a newly formed Public Works Department. G. E. Hauer, who has been in charge of Infilco's municipal sewage and biological waste treatment activities, will manage the new department.

Also announced at the same time by E. G. Kominek, vice president and general sales manager, was the consolidation of the company's industrial operations into one department under the management of H. W. Frazer. Previously in charge of Infilco activities in ion exchange and demineralization fields, Mr. Frazer will now be in supervision of all Infilco's work in water and waste treatment for all industries.

Allied Chemical's Solvay Process Division has appointed Ernest K. Leins West Coast sales branch manager. In this position, Mr. Leins will manage the sale of Solvay products in the Pacific Coast states. He succeeds John W. Priesing, who has been appointed assistant manager of the New York sales branch, Solvay's largest sales office.

Mr. Leins joined Solvay as a plant chemist in 1949 after receiving his chemical engineering degree from Cornell University. He was assigned to the Technical Service Department in 1952 and subsequently became assistant general manager of the department. Prior to his present appointment, Mr Leins had been a salesman at Solvay's New Orleans branch. He is now located at Allied Chemical's consolidated sales office—235 Montgomery Street, San Francisco 4, Calif.

Mr. Priesing joined the comptroller's department of Allied Chemical in 1956 as a financial analyst. Transferring to sales, he was assigned to the Detroit sales branch and then named manager of the West Coast branch. In his new position, he will be located at 261 Madison Avenue, New York 16, N. Y.

Richard Markwith

W. H. Mehaffey

Lamb-Grays Harbor Co., Hoquiam, Washington, has appointed Richard Markwith and William H. Mehaffey to the sales engineering staff.

Mr. Markwith, formerly plant manager for J. & J. Rogers Co., New York, was most recently associated with Pioneer Division, The Flintkote Co., as plant engineer in its Vernon, Calif., paper and roofing divisions. He is a graduate mechanical engineer of Stevens Institute of Technology.

Mr. Mehaffey was formerly sales manager for Hydraulics Machinery, Ltd. of Canada and sales engineer for Sprout Waldron Co. He is a science graduate of McGill University.

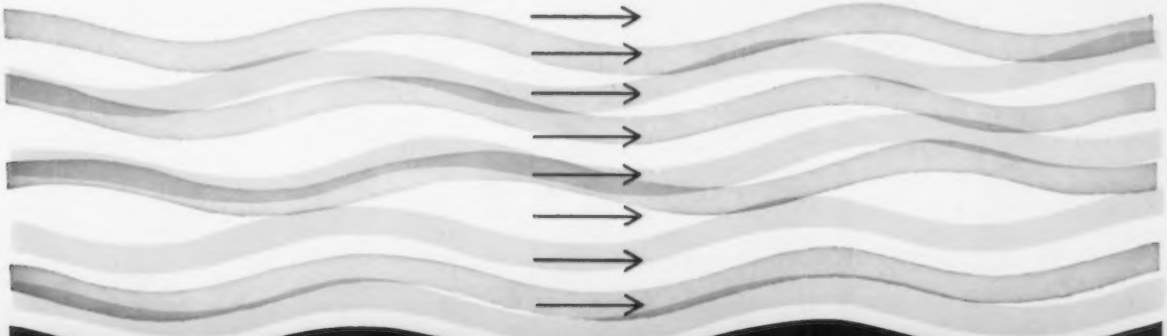
Dodge Manufacturing Co., Mishawaka, Ind., has appointed Robert K. Fuson administrative assistant-sales. Mr. Fuson attended Purdue

Honeywell announces the NEW series 1400 low flow control valve

The addition of the new Series 1400 valve body to the Honeywell line of control valves now gives you a choice of actuator-body combinations to match your applications. Now you can choose the exact type and degree of control you need, without pushing a valve beyond its design limits . . . or without paying for more performance than you need.

The compact Series 1400 valve body is available in a full range of materials, ratings and sizes, with screwed or flanged ends. It can be used to regulate small flows in process, pilot plant, research and commercial control systems. Each body size (½", ¾" and 1") has a wide range of reduced ports with Cv's from .025 to 11.0. Two bonnet constructions facilitate mounting of five types of actuators —three pneumatic and two electric.

Each actuator-body combination fits a different range of operating conditions and performance characteristics, but with sufficient overlapping of these ranges to give you a wider selection on the basis of cost. For complete details, write for Bulletin B803-1. MINNEAPOLIS-HONEYWELL, Fort Washington, Pa.



Model 1401 Low Flow Valve with heavy-duty pneumatic actuator for systems requiring high shut-off ratings and accurate valve positioning.

Model 1403 Low Flow Valve with compact, light weight pneumatic actuator for average industrial and commercial control systems.

Model 1404 Low Flow Valve with reduced port Cv's to .025 and top-mounted positioner integral with pneumatic actuator.

Model 1406 Low Flow Valve with *Modutrol* capacitor-type, electric motor actuator for two-position, floating or proportional control.

Model 1407 Low Flow Valve with heavy-duty *Actionator* electric motor actuator provides more power for higher valve shutoff ratings.

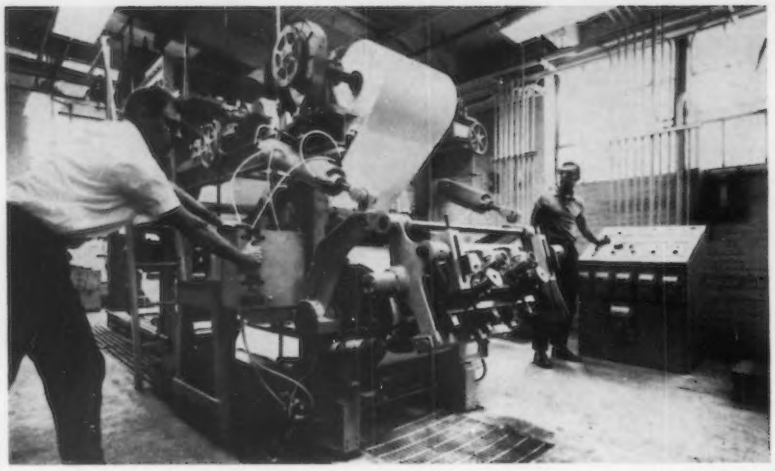
HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

University, West Lafayette, Ind., and joined the Dodge organization 25 years ago. His experience includes assignments as district sales manager in three different territories, covering New York, Michigan, Texas and Oklahoma. Five years ago he became assistant manager of engineering sales, a position that has brought him into close contact with many manufacturers of original equipment on which Dodge mechanical transmission products are used.

Samuel M. Langston Co., Camden, N. J., has concluded a licensing agreement with Mitsubishi Heavy-Industries, Reorganized, Ltd., of Japan.

Under the agreement, Mitsubishi Heavy-Industries, well known in other heavy machinery fields, will produce Langston-Mitsubishi corrugating units and die presses and Greenwood-Mitsubishi printer-slotters and folder-gluers for sale in Japan, the Philippines, India and other Asian countries.

Mitsubishi will build the corrugating equipment and printer-slotters at its Mihara Engineering Works at Mihara, Hiroshima Prefecture, Japan. The first unit, a 78-inch wide machine for a Japanese customer, will be shipped early next year.



Rohm & Haas Co., producer of the Rhoplex series of emulsions, has just installed at its Bridesburg, Philadelphia, laboratories a high speed Rice-Barton pilot plant coater for 24-inch-wide stock. It can be used in any of five ways: as a trailing blade coater, as a roll coater, as a horizontal size press coater, as a vertical size press coater, or as an air knife coater. This new equipment for testing experimental coating systems on a commercial-type machine will facilitate the product development work of the paper chemists at the Rohm & Haas Products Division.

The machine can coat both very thin stock, such as breadwrap, and heavy stock, such as folding boxboard and bleached kraft paperboard. Speed is adjustable from 100 to 2500 feet per minute. The unit is also equipped with three compact and efficient high-velocity dryers. Complete instrumentation and adjustability characterize the setup (see photo).

Combustion Engineering, Inc., has appointed Magnus C. Herder as district manager of the Pittsburgh office.

Mr. Herder, who succeeds the late John E. Bass, is an engineering graduate of Marquette University. He joined Combustion in 1948 and, after six years in field service in the Chicago area and in Europe, was assigned to the sales staff of the Pittsburgh office.

Morris Machine Works has elected Carlton M. Sloat vice president. Mr. Sloat will continue to be responsible for all phases of manufacturing at the Baldwinsville, N. Y., firm.

Before joining Morris last year, Mr. Sloat was manager of the machinery division of Sealright-Oswego Falls Corp. at Fulton. He is a graduate of Rensselaer Polytechnic Institute with a degree in mechanical engineering in 1937.

He has also been with Carrier Corp. and Curtiss-Wright Corp. as a project engineer.

Goodyear Chemical division has appointed David Findlay as sales engineer for the coatings department.

Mr. Findlay has 10 years of experience in synthetic rubber latices for the coatings field. He has been with Goodyear since 1957 as a de-

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FOR *IMPROVED* CONTINUOUS CLEANING

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WRITE or CALL for descriptive information, NEW catalogue . . .

A. P. WAGENKNECHT CO., INC., Thompsonville, Conn.
Foremost developers of auxiliary paper machine equipment

velopment engineer working with the company's line of Pliolite synthetic latices for various coatings applications. Prior to joining the company, he was associated with latex compounding and sales work for several years. Mr. Findlay was graduated from Massachusetts Institute of Technology in 1951 with a bachelor of science degree.

Sprout, Waldron & Co., Inc., Muncy, Pa., has announced that Robert M. Miller has been assigned as sales representative in the New Jersey, Pennsylvania and Delaware area. Mr. Miller, with Sprout-Waldron since 1937, has been active in the pulp and paper field since 1949. He expects to maintain his residence in Muncy.

K. Khandelwal

R. M. Miller

Overly's, Inc., Neenah, Wis., announces the appointment of Krishna Khandelwal as director of technical services for the company's broad range of products for the paper industry.

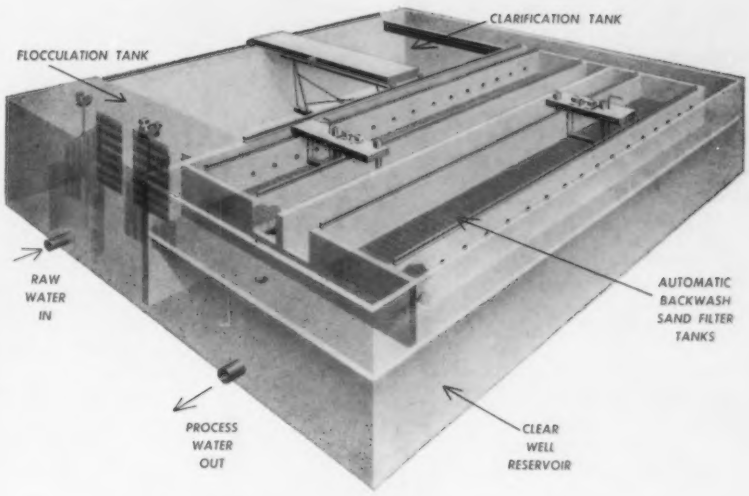
Dr. Khandelwal is a 1950 graduate of the State University of Iowa, Iowa City, Iowa. He holds an M.S. degree in pulp and paper technology from the University of Maine, Orono, and a Ph.D. in chemical engineering from Syracuse University, Syracuse, N. Y.

Prior to joining Overly's, Dr. Khandelwal worked as project engineer, senior development engineer, research engineer and export sales engineer for several large manufacturers of pulp and papermaking machinery.

Overly's, Inc., serves the paper industry in custom fabrication of engineered air systems, machine hoods, Gardner dryers, fans and steam coils, stock pipe, distributor rolls, suction boxes, white-water pans, head boxes, tanks and heat reclaiming systems.

J. M. Huber Corp., has formed three new departments to expand the development of new products and new markets. The new Product Development group, at Havre de Grace, Md., will be part of the

NEW *"Unitized"* WATER-TREATMENT SYSTEM *by Hardinge*



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corporation's Chemicals Division. The new Market Development and Technical Service groups will be part of the Industrial Products department.

Responsibilities of the Product Development group will include activities in three areas. It will recommend use research; perform evaluation, research, and survey functions in connection with new products and new uses for modifications of existing products; and work with the new Market Development group on the evaluation and establishment of new markets.

The Market Development unit will develop marketing information including pricing, packaging, and channels of distribution, for new products. It will establish contacts for consumer testing and trials. This group will also provide technical information for the Industrial Products Department, train sales personnel, and provide technical service, aided by Product Development, until the new Technical Service group is ready to assume such service.

In addition to preparing technical sales literature, technical training of salesmen, and providing specialized technical service and contacts with customers, the Technical Service group will perform some research and study functions. It will organize laboratory studies to solve customer problems, organize and supervise special studies within customer plants, aid development of better commercial formulations, and provide guidance on the type of research to be done on existing products.

CHAS. T. MAIN, INC.
ENGINEERS
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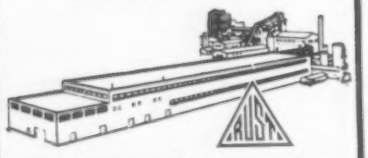
PULP AND PAPER MILLS
STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING REPORTS, CONSULTATION, VALUATIONS
BOSTON, MASSACHUSETTS
CHARLOTTE, NORTH CAROLINA

PRODUCTIVE LANDMARKS
for Economic Growth

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APPRAISALS
ESTIMATES AND SURVEYS

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Oct. 7	Oct. 14	Oct. 21	Oct. 28	Nov. 4
1961	93.0r	95.2r	93.3r	94.7r	95.4
	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov. 5
1960	93.6	95.3	94.5	95.8	91.8

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0	91.2	91.2	91.6	91.3	78.0	90.5	88.2	94.0‡			

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	91.9	96.2	98.5	91.2	87.0	92.6	93.9	89.6
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Oct. 7	Oct. 14	Oct. 21	Oct. 28	Nov. 4
1961	97	98	97	99	97
	Oct. 8	Oct. 15	Oct. 22	Oct. 29	Nov. 5
1960	92	94	93	91	88

COMPARATIVE MONTHLY SUMMARIES

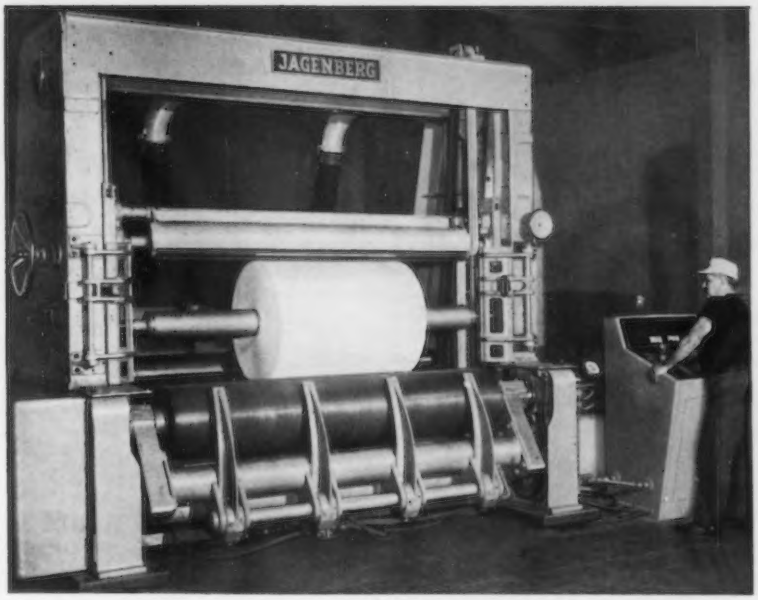
Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	89	89	92	91	92	94	78	95	92	98			

† *Per cent of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING October 28, 1961	WEEK ENDING Nov. 4, 1961	CUMULATIVE TO DATE January 1, 1961 to November 4, 1961
% Activity	99%	97%	91%
Total	356,111	352,866	14,020,159
Containerboard—Domestic Use	187,427	193,841 (H)	7,213,365
Liner	127,703	130,964	4,812,529
Corrugating Material	55,092	58,731	2,188,733
Chip & Filler Board	4,632	4,146	212,103
Boxboard—Domestic Use	104,676	95,044	4,219,509
Folding	63,801	60,515	2,522,186
Set-Up	10,858	9,548	413,006
Special Food Board	30,017	24,981	1,284,317
Other Paperboard	64,068	63,981	2,587,285
Containerboard Type	31,129	26,925	1,243,351
Boxboard Type	32,879	37,056	1,343,934
Total Orders			
Received	329,629	388,044 #	
Unfilled End of Week	521,854	557,378	

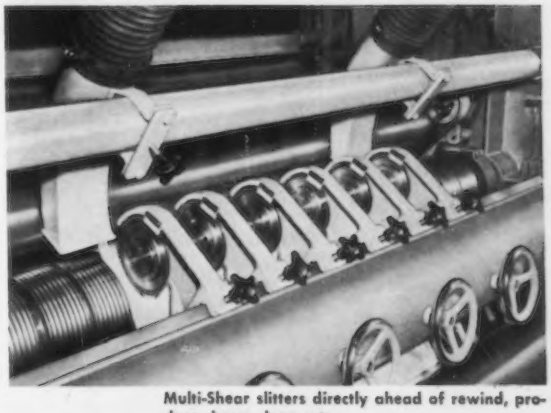
Orders Received are at all time high both on actual and seasonally adjusted basis.
(H) New record high production.



Model 30 operating at Westvaco's Tyrone Mill, rewinding and slitting narrow rolls.

why WESTVACO bought the JAGENBERG Pneumatic Winder...

J. Lynne Ferner, Manager of the Tyrone-Williamsburg Division says: "Our mill at Tyrone, Pa., is in the fine papers business and we're constantly on the alert for new equipment and processes which will contribute to greater operating efficiency and improved quality. We installed a Jagenberg pneumatic winder at Tyrone after one of our engineers had had an opportunity to study its performance in commercial operation in Germany. The equipment is doing a good job of producing well-wound narrow rolls, principally for the envelope trade."



Multi-Shear slitters directly ahead of rewind, produce sharp, clean cuts.

JAGENBERG Available in three different Models, 60" to 160" wide, the JAGENBERG Pneumatic Winder can be installed behind the Paper Machine or off the Machine. Its special features include the "Multi-Shear" slitting system, a unique type of rewind shaft guide, driven fly rolls and a built-in roll lowering device. Pneumatic operation throughout. Speeds up to 4,000 fpm. Precision engineered by JAGENBERG, world's largest manufacturers of paper finishing equipment. Contact our representatives for full details.

Finished rolls separate easily, have clean straight sides.

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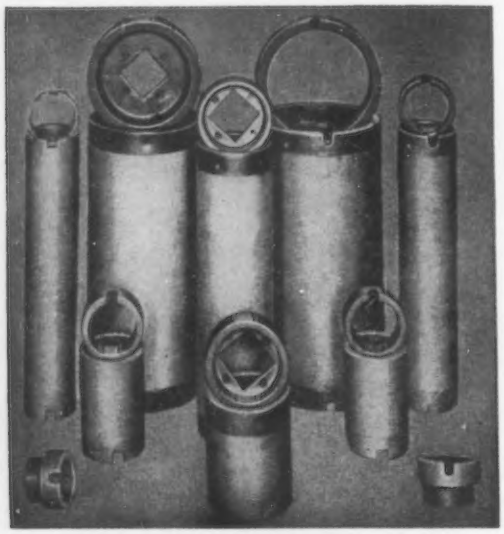

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Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

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This revolutionary development represents eight years of research, and has created a new technology in papermaking. Recent technological breakthroughs have broadened its successful application to a wide variety of machine conditions and paper grades, presenting an outstanding opportunity for personal growth and professional advancement.

Requirements: Engineering background, and experience selling technical products to papermakers.

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21 SECONDS *to Test Stiffness of Paper and Paper Board*

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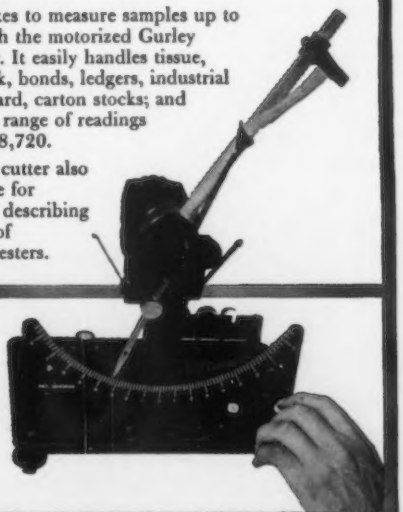

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New steam-detergent gun packs a cleaning wallop

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Steam-gunning with a hot detergent solution isn't new. What's new is a steam gun that's not heavy, not cumbersome, not dangerously hot.

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Find out how the "Hurriclean" gun can save your mill money by blasting pulp, slime and soil from hard-to-reach corners of tanks and equipment ... and how it saves time on special jobs like paint stripping. Call your Oakite Technical Service Representative or write for booklet. Oakite Products, Inc., 48A Rector St., New York 6, N.Y.

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Requirements:
B.S. Chemical Engineer with good academic record
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Salary: Commensurate with qualifications

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Industrial Relations Manager

West Virginia Pulp and Paper

Fine Papers Division
Luke, Maryland TF

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2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs.

BREAKER STACK
1—120″ Sandy Hill Breaker Stack, AF Brngs., hydraulic nip pressure.

CALENDER STACKS
1—3 roll 84″ face.
1—4 roll 72″ face (Extra heavy duty).
1—5 roll 86″ face.

CHIPPERS
1—96″ Murray 4 knife Chipper—anti-friction bearings.
1—84″ 10 knife Carthage Chipper. Anti-friction bearings, with motor.

COATERS
1—27″ High Solid Coater.
1—42″ Chapman Extrusion Type Coater.

CORE CUTTER
1—48″ Keystone Core Cutter.

COUCH ROLLS (RUBBER COVERED)
6—18″ diameter x 138″ face

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
1—Williams Hammermill.
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CYLINDER MOLDS
5—36″ diameter x 75″ face, with couch rolls.
1—42″ diameter x 96″ face.
2—42″ diameter x 106″ face.
2—60″ diameter x 170″ face.

DRIVES
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive).
1—#4 Reeves Drive.
2—Falk Drives, 20 H.P. & 160 H.P.
4—Falk Chest Agitator Drives, 10 H.P. ratio 140 to 1.

DRYERS
1—18″ diameter x 54″ face (steel).
1—28″ diameter x 84″ face.
1—28″ diameter x 48″ face.
4—28″ diameter x 40″ face.
18—28″ diameter x 76″ face, with frames, gears & bearings.
2—28″ diameter x 62″ face, with frames, gears & bearings.
2—30″ diameter x 128″ face, bronze, with frames, gears & necessary rolls to make up the unit.
1—36″ diameter x 44″ face.
4—36″ diameter x 76″ face.
11—36″ diameter x 84″ face.
2—36″ diameter x 120″ face with frames, bearings and gears.
2—48″ dia. x 52″ face with frames, gears, bearings.
2—48″ x 60″ face frames, gears & bearings.
1—48″ diameter x 108″ face.
29—48″ diameter x 109″ face, complete section
6—48″ diameter x 130″ face.

EMBOSSING CALENDERS
1—43″ 3-roll Embossing Calender.
1—48″ 2-roll Meadows Embossing Calender.
1—51½″ 3-roll Smoothing Calender.
1—57″ 3-roll Embossing Calender.
1—62″ 2-roll Embosser.
1—90″ 2-roll Smoothing Calender.

FILTERS
1—Oliver, 10 ft. face x 5½ ft. diameter.
1—Oliver, 8 ft. x 12 ft., rubber lined complete.
1—Oliver Filter, 8 ft. x 8 ft.
1—Dorr-Oliver Filter, 3 ft. dia. x 6 ft. face, stainless steel construction, with pump.

FLAT SCREENS
1—12 Plate "Packer".
4—14 Plate IMPCO, bronze vats.

HOG
1—18′ Hog.

JORDANS
1—#1 Jones High Speed Jordan.
1—Jones Standard, new spare tackle, with 75 h.p. motor.
1—Noble & Wood Mammoth Jr., with spare plug.
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor.
1—#6 Miami, anti-friction bearings.

KNIFE GRINDER
1—70″ Seybold.

LABORATORY EQUIPMENT
1—Washer for 5 lb. Beater.
1—24″ Saveall, stainless steel.
1—20″ Fourdrinier Wet End & Press Section.
1—Noble & Wood Cycle Beater with motor & stand.
1—1½ lb. Valley Iron Beater.
1—5 lb. Beater.
1—Williams Freeness Tester.
7—Mullen Testers, motorized & hand operated.
1—2 qt. Auto Clave. Stainless Steel.
1—27″ High Solid Coater.
1—Noble & Wood Baby Jordan, anti-friction bearings, with 20 h.p. motor.
1—Emerson, Jr., No. 1 Jordans, anti-friction bearings.
1—24″ diameter x 24″ face Stainless Steel Cooling Drum.

METAL DETECTOR
1—Dings Metal Detector.

MISCELLANEOUS
1—Shartle Hydrafuge, 1000 g.p.m. (with motor).

MOTORS
4—25 h.p. Westinghouse, totally enclosed, ball bearing, 705 r.p.m.

PAPER MACHINE
1—110″ Fourdrinier Paper Machine

PRESSAFINER
1—7″ Pressafiner, stainless steel construction, New 1955, with new spare motor.

PRESS ROLLS
2—Chilled iron, chrome plated 9″ x 72″.
1—Chilled iron, chrome plated 10″ x 74″.

PUMP
1—Economy Fan Pump 6000 g.p.m., 20′ head, 50 h.p. motor.

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1—72″ Downingtown Reel, 2 bowl.
1—84″ 3 bowl revolving reel.
1—86″ 2 bowl reel.
1—100″ Rice Barton 2 bowl Reel, heavy duty.
1—116″ Downingtown, 2 bowl, anti-friction bearings.
1—123″ 3 bowl Revolving Reel.
1—130″ Pope Reel (Rice Barton).
1—134″ 2 Drum.

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1—Rice Barton Dynofiner, details on request.
1—12″ Wiener Refiner, with 200 h.p. motor.
2—36″ Bauer double disc #185E Refiners, each with two 100 h.p. motors.
1—#4 Dilts Hydrafiner, anti-friction bearings.

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1—Valley Iron Roll Heading Machine, complete, for paper rolls 100″ long x 42″ diameter.
1—Murray Roll Header, 40″ x 90″, complete with scales and recorder.

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1—#2A—50 Bird, copper vat.
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1—16″ "Swift" Paper Shredder.
2—Taylor Stiles Rag Cutters.

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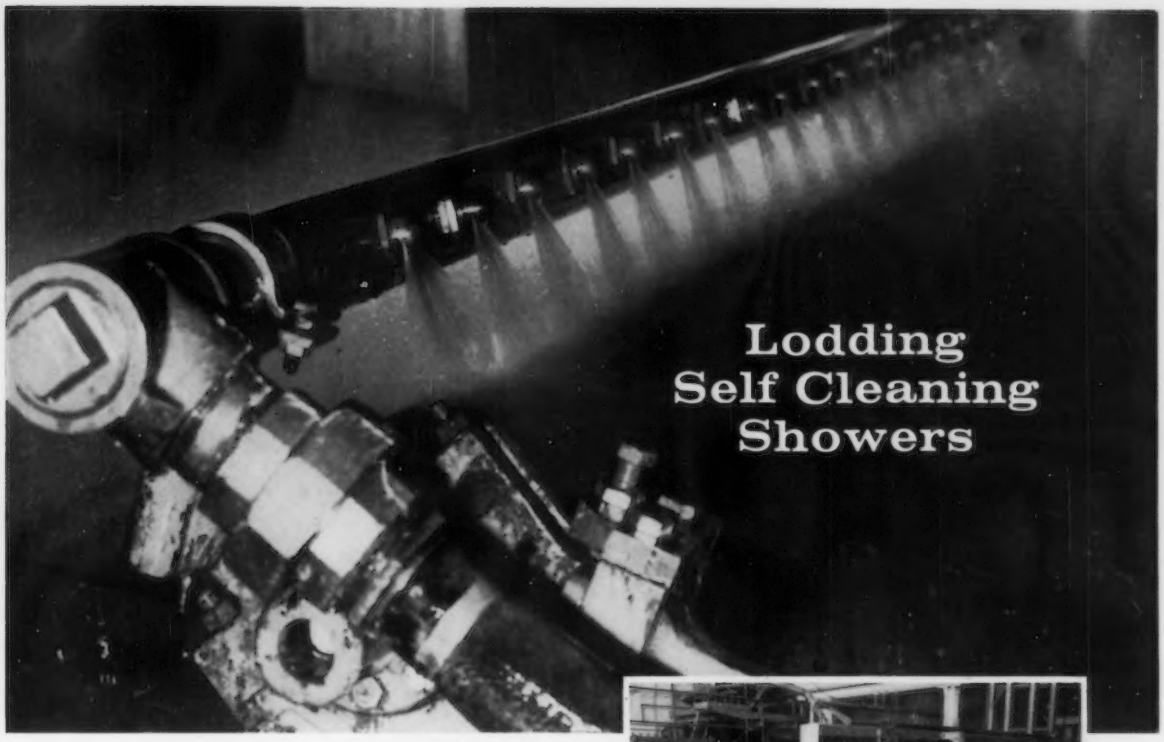

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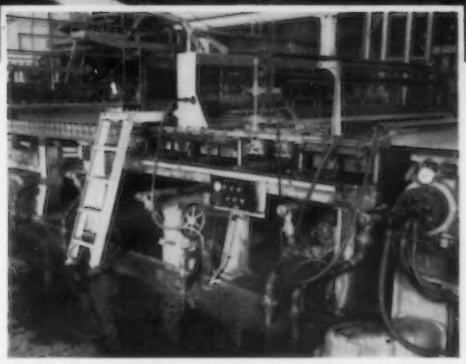

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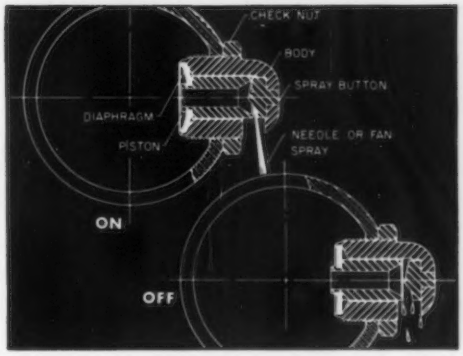

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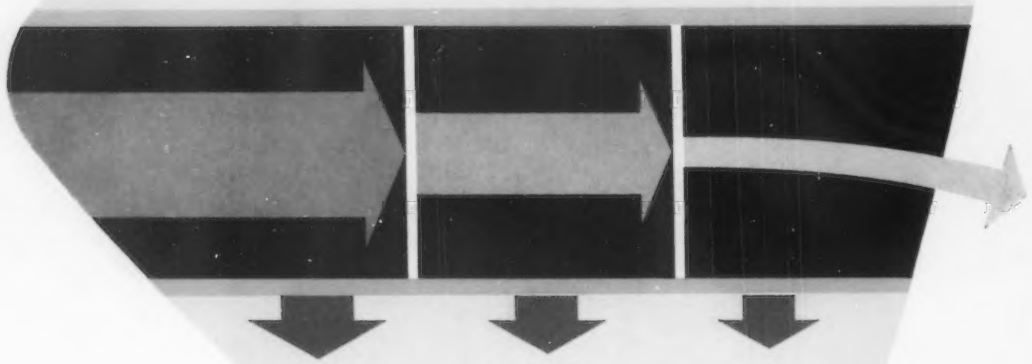
Cowan K-series centrifugal pulp screen operates at 100% increase in inlet consistency and a 66% decrease in fiber rejects.



In principle the new K-series screen, which in place of white water uses feed pulp as dilution in an elongated and narrowed cylinder, sharply increases the acceptance of pulp fiber for a given screen plate area.

By retaining the water-carried fiber longer within the cylinder, greater separation is accomplished.

Saving at the intake end: since input consistency can be higher by 100%, you need move less water per ton of accepted fiber.

Saving at the outlet end: since reject fiber is reduced by two-thirds, secondary screening requirements are also reduced or eliminated.

We would like to discuss the K-series screen with you. Your letter, phone call or wire will get prompt action.

S.W. HOOPER CORPORATION

Manufacturers of pulp and paper mill equipment
P.O. Box 129, Delmar, N.Y. Telephone HEmlock 9-5231

In Canada: S.W. HOOPER & CO. LTD. 5460 Patricia Avenue, Montreal 29 — Telephone HUnter 1-1161